

THE LION, THE LIONESS, AND THEIR CUBS.

A

POPULAR INTRODUCTION

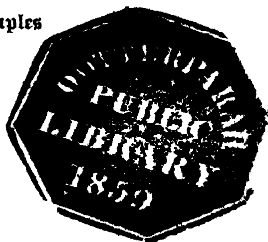
TO THE STUDY OF

QUADRUPEDS;

OR, ON

THE CLASS MAMMALIA,

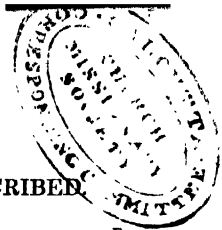
On Scientific Principles



LONDON:
THE RELIGIOUS TRACT SOCIETY,
Instituted 1799
SOLD AT THE DEPOSITORY, 56, PATERNOSTER ROW,
AND 65, ST PAUL'S CHURCHYARD, AND
BY THE BOOKSELLERS

CONTENTS.





NAMES OF ANIMALS DESCRIBED.

ENGRAVINGS OF ANIMALS.

Quadrumana.

Carnivora.

In the composition of the following Work, the Author, desirous as he was to avoid them, found himself compelled in many instances to make use of terms either strictly technical or little used except in scientific writings, and consequently restricted and peculiar in their meaning. It has therefore been deemed advisable to give an explanation of such words, not indeed for the assistance of persons of more advanced age and information, but for that of the younger portion of our readers, who cannot be supposed to be acquainted with them. With this apology, then, we take the liberty of inserting the subjoined

VOCABULARY.

Albumen. A chemical term for one of the components of animal bodies: white of egg is an example of albumen; jelly procured from isinglass is another; and also glue.

Alkaline. A chemical term for certain substances; namely, soda, potash, and ammonia, which have peculiar properties opposite to those of *acids.*

Antagonize. To oppose, or be in opposition, as the thumb to the fingers.

Apex. Point or tip.

Arborescent. Like the branches of a tree; from *arbor*, a tree.

Articulation. Joint; from *articulus*, a joint.

Azote. A term, of Greek origin, for a certain gaseous substance called also nitrogen.

Bimana. The first order of Mammalia, embracing such as have only two hands; from *bis*, two; and *manus*, a hand. Man is the only example. See p. 12.

Boreal. Belonging to the extreme northern latitudes.

Canine. From *canis*, a dog; thus, canine teeth are the pointed teeth between the cutting teeth and the grinders, and which are peculiarly large in the dog tribe.

Carbon. A chemical substance; charcoal is a familiar example.

Cardiac. Cardiac portion of the stomach; from the Greek *καρδια*, or the opening into the stomach.

Carnivora. An order of mammalia living on flesh; from *caro*, flesh; and *voro*, to devour.

Cetacea. An order of mammalia, embracing the whales; from *cete*, or the Greek κητος, a whale. See p. 14.
Cinereous. Ash-coloured, or grayish; from *cinis*, ashes, or embers.
Clavicles. A term in anatomy for the collar-bones.
Cæcum. An anatomical term for a portion of the intestines.
Conch. A fold of the external membrane of the ear; from *concha*, a shell, because of the similarity. Page 101.
Congeners. Animals belonging to one and the same genus or kindred.
Congeries. Compacted mass or heap.
Convoluted. Twisted round.
Cuticular. Belonging to the skin.
Cutis. Skin.

Detrition. Grinding down; from *detero*, to wear down by rubbing together.
Dorsal. Belonging to the back; from *dorsum*, back.

Edentata. An order of mammalia, characterised by a want of teeth; from *a* or *e*, implying absence, and *dens*, a tooth. See p. 13.
Feline. Of the cat kind; from *felis*, a cat.
Ficus. A botanical genus; the fig-tree is an example.

Gelatine. See *Albumen.*

Habitat. A technical word, meaning native locality, or natural abode.
Herbivorous. Feeding on herbage or plants; from *herba*, a herb; and *voro*, to devour.
Homo troglodytes. Literally translated, "the man-dweller in the caves."
Humerus. The bone of the shoulder.
Hybernation. To pass the winter in a state of repose; from *hyberno*, to lie by in winter quarters.
Hydrogen. In chemistry, a peculiar gaseous substance.

Incisores. The cutting teeth; from *incido*, to cut.
Insectivorous. Insect-eating.
Intestinal. Belonging to the intestines or bowels.
Intertropical. Between the tropics.
Lachrymal. *Lachrymal fossæ*, pits below the eye in the deer tribe. See p. 407, &c.
Laminæ. Plural of *lamina*, a layer.
Larvæ. By the term Larva, in natural history, is implied that state which caterpillars assume previously to their final change into the perfect form of a fly, moth, or beetle; it is also applied to the rudimentary state of many animals pre-

ceding their mature and perfect condition: thus the tadpole is the larva state of the frog.

Limbered. A military term applied to cannon.

Lobular. Lobe-shaped, rounded.

Lubricated. To lubricate, to smear over with any smooth or slippery fluid.

Mahout. A name given in India to the person who guides the elephant, and is seated on the animal's neck. See p. 326.

Mammalia. A class of animals which suckle their young; from *mamma*, a breast. See p. 11.

Marsupialia. An order of *mammalia*, with pouches for the reception of the young; from *marsupium*, a pouch. See p. 13.

Media. Plural of the Latin word *medium*, signifying the common or surrounding element of any particular body.

Molares. The grinding teeth; from *mola*, a mill, or *molo*, to grind.

Nitrogen. A peculiar aëriform or gaseous substance known in chemistry under this title; the word is of Greek derivation.

Nomadic. Wandering in a pastoral state of society; from the Greek Νομαδικος: hence the wandering races of India and Arabia were anciently called *Nomades.*

Nomenclature. The application of descriptive names to objects.

Occiput. The back part of the skull.

Occipital. Connected with or belonging to the back part of the skull.

Œsophagus. The gullet for the passage of the food into the stomach.

Olecranon. An anatomical term of Greek extraction, signifying that portion of one of the bones of the fore arm which forms the point of the elbow.

Orbitar. Connected with the orbits of the eye, or with the bones which compose the orbits.

Oxygen. A peculiar gaseous substance known in chemistry by this title.

Pachydermata. An order of animals characterised by the thickness of the skin; from the Greek *παχυς*, thick; and *δερμα*, skin. See p. 13

Palmated. Broad like the palm, with shoots growing out like fingers; from *palma*, the palm. See p. 381, *palmated horns.*

Pastern. The joint above the horse's hoof.

Pelvis. The hip, or bones composing it.

Permeate. To flow through. See p. 412.

Physiology. The doctrine of the laws of living bodies. Of Greek derivation.

Plantigrade. Walking on the entire sole of the foot; from *planta*, the sole, and *gradus*, a step.
Plicated. Arranged in folds; from *plica*, a fold.
Prehension. The grasping or holding; from *prehendo*, to seize or grasp.
Pubic. Pubic bones, or pubic portion of the pelvis; the anterior bones which join with those of the hips.

Quadrumana. An order of mammalia, having four hands. See p. 12.

Recurved. Bent back.
Rodent. Gnawing.
Rodentia. An order of mammalia, so called from their possessing teeth formed for gnawing; from *rodo*, to gnaw. See p. 13.
Rudimentary. At the lowest point of developement of formation.
Rufous. From *rufus*, reddish, or brownish red.
Ruminantia. An order of mammalia which ruminate or chew the cud. See p. 13.
Ruminating. Chewing the cud.

Scapula. Shoulder-blade.
Semi-retractile. Capable of being partially withdrawn.
Sinuses. Pits, hollows, or cavities; a technical word; from *sinus*, a hollow.
Subgenera. Subgenus, a portion of a genus, having peculiar characters.
Suborbital. Below the orbit.
Succulent. Full of juice.
Suture. *Sutura*, a seam, or joining together.

Trachea. The windpipe; from the Greek τραχυς, rough, because it is composed of a series of rings of cartilage.
Tubercles. Projecting points or parts.

Ulna. One of the bones of the fore arm, ending at the elbow, in the part called *olecranon*, which see.
Umbre. A dark brown colour inclining to black.

Vascular. Full of minute blood vessels.
Vertical. Erect; the *vertex*, or crown of the head, being the highest, and the body succeeding in a perpendicular direction to it.
Viscid. Sticky, or clammy.

Withers. The withers of a horse; the top of the shoulders adjoining the neck.

A

POPULAR INTRODUCTION

TO THE

Study of Quadrupeds, on Scientific Principles.

ADAPTED FOR YOUTH.

O Lord, how manifold are thy works! in wisdom hast thou made them all: the earth is full of thy riches. Psa. civ. 24. Such was the declaration of the inspired psalmist of old; and surely in the works of the Almighty we have before us a book, every page of which presents to the christian reader abundant and astonishing proofs of the wisdom, power, and goodness of Him, who said, "Let there be light, and there was light;" "who weighs the mountains in scales, and the hills in a balance;" "who led Joseph like a flock;" and who condescends to be the Father and Friend of his people in all generations. If, christian, this great and holy God is thy Father and thy Friend, thou wilt not behold the wonders of his hands with indifference; and as we all look with emotions of pleasure and love upon the hand-writing of an earthly friend or an earthly father, so wilt thou contemplate

with admiration and gratitude the characters, more eloquent than speech, with which He has impressed the face of nature.

The study of Natural History is pregnant with pure delights and solid advantages: the order, the design, and balance observable in its laws, the combinations of structure and mechanism with which they are associated, the ends to be obtained, and the simplicity of the means for obtaining them, are all so many proofs of Divine wisdom and superintendence. We look with delight, and with the more delight as we understand the more, on the beautiful and complicated machinery of our manufactories, which seems to perform so many labours as it were by enchantment; but in Natural History we behold a scheme more vast, a structure more curious, operations more complicated, ends more important, means more adapted, and laws more profound. Here the christian philosopher, as he explores the mines of research, or investigates the various phenomena, the laws or habits of the tribes that people earth and air, will feel a calm and pure delight, unmixed with the baser passions which the man of the world, in his pursuit of riches, or empty honours, or vain applause, can neither experience nor understand. Here he is led by the hand of Nature, and he leaves the city and the mart, and all the pageantry of artificial life,—he leaves the turmoil, the follies, and the crimes of an agitated world, and goes forth into the green fields, and wanders by the river's flowery brink, or through the tangled wood, in holy and peaceful contemplation. To him the bounding deer, the crouching hare, the linnet carolling from the brake, the turtle cooing in

the woodland gloom, the woodpecker tapping the aged tree, the kingfisher darting like a meteor down the stream, or the little warblers of the hedge-row, are objects of interest; the nimble lizard as it rustles through the leaves, the chirping grasshopper, and the busy insect tribes of brilliant hues that glitter like diamonds in the sun, the active murmuring bee, the shard-born beetle that winds " his low but sullen horn,"—all have claims on his attention, all are objects of contemplation, all lead him to the Cause of causes; for he forgetteth not His power who made and governs all—His, the eternal Word, who was in the beginning, and was with God, and was God, and without whom was not any thing made that was made.

The youthful student of nature beholds every where an order, a balance, a harmony, the contemplation of which expands the intellect, produces a love of order, and habits of patient research: he is not content with a careless glance over what God has pronounced *good*, but he loves to trace His power and goodness with a more observant eye,—His power, which is displayed as much in an insect's wing as in the pinions of the eagle, or the limbs of the gigantic elephant.

An acquaintance with nature leads also to a kindly feeling for all that God has created. How often does man exercise his wanton cruelty upon the dumb creatures, over whom he is placed as a *master*, and not a *tyrant;* but were he to familiarize himself with the instincts and habits of the animated beings below him, he would learn to regard them with sympathy and forbearing pity. He would remember God's mercy to him, unworthy and covered with guilt; he would

remember what God has done for him; he would remember the benevolence of his Lord and Master, who, while he proclaimed his abounding love for his people, whom he has ransomed with his blood, expressed his care also for the commonest bird of the house-top. "Are not two sparrows sold for a farthing? and one of them shall not fall on the ground without your Father. But the very hairs of your head are all numbered."—Matt. x. 29, 30.

Christian reader, reflect on God's mercy to you, he has not dealt with you according to your sins, but he has held out to you offers of pardon; he has not rewarded you according to your iniquities, but He has provided a Saviour, an all-sufficient one, in whose atoning blood there is presented to the guiltiest a fountain for sin and uncleanness; and by whose intercession we have access to the throne of grace. Such is God's free mercy and love to you. Imitate this great and glorious example, and, as thou hast obtained mercy, be merciful to all that breathes.

> "I would not enter on my list of friends
> (Though graced with polish'd manners and fine sense,
> Yet wanting sensibility) the man
> Who needlessly sets foot upon a worm.
> The inadvertent step may crush the snail
> That crawls at evening in the public path;
> But he that has humanity, forewarn'd,
> Will tread aside, and let the reptile live."
>
> COWPER.

All natural objects with which we are acquainted by means of our senses, and which constitute this globe, and all upon its surface, are separated into TWO GREAT DIVISIONS OF GENERAL CLASSES; namely, the ORGANIC,

and the INORGANIC, distinguished by laws which draw a decided line between them, the boundaries of which are precise and defined.

The *organic* division comprehends all bodies endued with vitality. The *inorganic*, those not possessing this principle. To the former, therefore, belong animals and plants; to the latter, all other bodies cognizable by our senses.

Animals are natural bodies, *organized, living,* and *sentient.*

Vegetables are natural bodies, *organized* and *living,* but not *sentient.*

All other bodies are *neither organized,* nor *living,* nor *sentient.*

The phenomena manifested by all organic bodies are the result of an inherent power, which the allwise God has associated to such combinations of matter, and which is generally termed *vital principle,* a power the essence of which is enveloped in mystery, excepting as revealed to us in the scriptures. The general results of this power may be said to consist in a concatenation or vortex of complicated internal movements or actions, having no relation to the laws of chemistry or mechanics, and which, enduring for a certain definite period, produces those external characters by which we at once know an organized being; namely, its *essential shape* and *structure,* its *growth,* by the absorption and assimilation (or conversion into a part of itself) of extraneous matter, and its power of resisting, during an appointed time, the influence of external agents.

Hence, organic bodies seem to maintain a perpetual struggle with the elements around them, perpetually

resisting and making good the losses which their actions and influences occasion; perpetually throwing off those particles which are no longer fit for the keeping up of the body's integrity, and taking up others, which they mysteriously convert into a portion of themselves; perpetually labouring till death.

Inorganic matter does not increase by powers within itself, or resist external agents by the operations of a vital principle. Its laws are those only of mechanics, chemistry, and electricity.

Organic bodies then comprehend animals and plants; and between these two great classes, which possess the common properties of vitality, there are several characteristic distinctions:—

1. The power of voluntary motion, which animals in the aggregate possess, demands an according modification of the organs of nutrition; and hence is derived their first and leading character, namely, an *internal apparatus* for the reception of food, in which it undergoes certain changes before its admission into the system, an admission effected by a multitude of minute tubes or vessels, all originating in the inside of this apparatus. Plants are rooted to one spot; they cannot employ voluntary motion in the search or reception of food; they have no internal digestive apparatus, and the absorbing tubes of nutrition all arise from the external surface. The aliment taken in by animals has to undergo various operations before it forms a juice proper for absorption; but the atmosphere and the earth present to vegetables juices already prepared, and which may be absorbed immediately.

2. Animal bodies, as they have functions more

numerous and varied than plants, possess, with a structure accordingly more complicated, a circulatory system, (comprehending the arteries and veins,) by which their fluids are circulated, not, as is the case with plants, by the influence of heat and atmospheric action, but by internal innate energies. This system is, however, less essential than the digestive, because not necessary to, nor to be found in animals of the most simple organization.

3. Animals differ from plants in the chemical analysis of their constituent principles. The essential elements of organized matter appear to be *carbon, oxygen, hydrogen,* and *azote* or *nitrogen,* together with *alkaline* and *earthy salts.* Now the solid parts of all plants contain carbon, oxygen, and hydrogen, but no azote. The solid parts of animals consist principally of lime or magnesia united with carbonic or phosphoric acids. And in those beings of both kingdoms, which appear to be destitute of solid parts, the difference is even still more wide; the *gum* or *mucilage* of soft plants exhibiting no trace of *azote,* which enters as a constituent into the *gelatine* or *albumen* of soft animals.

4. Atmospheric air and water are the two sources whence the plant derives the principles necessary for the maintenance of vitality. Water is composed of oxygen and hydrogen; air, of oxygen, azote, and carbonic acid, which is a combination of oxygen and carbon.

Now of these elements, the vegetable retains, as essential to its composition, the carbon, the hydrogen, and a part of the oxygen, and exhales or throws out the azote and superfluous volume of oxygen. The

essential function, indeed, of vegetable life seems to be the exhalation of oxygen, an operation requiring the presence of that universal stimulus of nature, light.

The principles of vegetable composition, that is, carbon and hydrogen, enter also as a source of mediate or immediate nutriment into the composition of animal bodies. But the constitution of animals demands that a great portion of this hydrogen and carbon should be got rid of from time to time, and that azote should be absorbed. This operation is effected through the medium of the atmosphere, the oxygen of which, combining with the carbon and hydrogen of the blood, is exhaled with them in the form of carbonic acid and water, the azote appearing to remain. According to the experiments of Dr. Edwards, an absorption and discharge of azote is perpetually going on, the discharge varying according to habit, constitution, or the circumstances to which an individual may be subjected.

Plants and animals may thus be said to become mutual sources for the production of the elements each requires; the relations they bear to the atmosphere are inverse. The former demand water and carbonic acid, the latter produce it. Animals demand oxygen, and the vegetable creation is perpetually exhaling it.

And shall we not admire the wisdom of God, shall we not pay our tribute of adoration to Him "who hath done all things well?" Wonderful and mysterious as is the plan which we see displayed in the laws of organized beings, there is a plan, reader, still more wonderful and more mysterious, and which exhibits more fully the boundless wisdom and goodness of God, a plan by which justice and mercy are recon-

ciled, the plan of man's salvation, the results of which will outlive the laws of the animal and vegetable kingdoms, and the great globe itself.

Having thus separated between the animal and vegetable kingdoms, it is not our purpose to enter into the details of animal physiology, which, although it unfolds in a most striking manner the glorious power and design of the Almighty, would carry us beyond our prescribed limits; but we shall proceed at once to the general divisions under which the scientific men of our day have arranged all that has a claim to animal existence. In so doing we propose to take Cuvier for our guide.

The woods and fields resound on every side with the cries and voices of creatures varying in form and nature; the air is peopled with busy tribes that wander through its boundless regions; the wing of the bird rustles as it passes us, and myriads of insects are dancing in the sun; the waters teem with life; the ocean, the mighty ocean is replete; even the "drop upon the bucket" is a lake to multitudes of animalcules, that rejoice and multiply in its mimic floods, or pine and die as it evaporates. We cannot pluck a leaf from a tree, and examine it, but we discover it to be a little world peopled with pigmy inhabitants, that play their part in the balance of creation, a part which may, indeed, escape the research of the philosopher, but which infinite Wisdom has appointed. Diversified, however, and multitudinous as they are, they admit of arrangements or classifications which unravel the intricacy of the subject, and divest the study of its apparent difficulties. It was a want of this system which has

rendered the works of the ancients, on natural objects, little more than records of disjointed facts, or opinions, without mutual bearing, or order or plan, and without a definite end. Hence the little comparative progress in the natural sciences, and the mistakes and absurdities which we find to have prevailed among nations the most civilized and refined. Modern science received a new impetus from the writings of Bacon, Ray, and Linnæus, which has regulated inquiry, and introduced method and order. Among the philosophers of the present day Cuvier stands preeminent, and his general outline is that which is now most commonly received. He divides the Animal kingdom into four grand divisions; namely,

1. *Animalia Vertebrata.*

Vertebrate animals, having a brain enclosed in an osseous covering, or skull, and a vertebral column.

2. *Animalia Molusca.*

Moluscous animals, without any internal skeleton, but whose muscles are attached to a soft skin, often enclosed in a hard case or shell of lime.

3. *Animalia Articulata.*

Articulated animals, in which the body is divided by transverse folds into a certain number of rings; the integuments are sometimes hard, and sometimes soft; but the muscles are always attached to the interior; the trunk is often furnished with many limbs, consisting of numerous joints, but is often also deficient; such are insects, crustaceous animals, as lobsters, &c.

4. *Animalia Radiata.*

Radiate animals, or zoophytes, in which the organs of movement are not disposed symmetrically on each side, but consist of an uneven number disposed like rays round a centre; they possess no nervous system, nor particular organs of sense, barely traces of a circulation, and approach in their structure the homogeneity of plants.

Vertebrate animals (Animalia vertebrata) are distinguished by an internal osseous frame-work or skeleton, which affords solidity and support. Their body is composed of a head, trunk, and limbs: the head consists of the skull, which encloses and protects the brain; and of the face, which embraces the organs of taste, smell, sight, and hearing. The head rests upon or is attached to the vertebral column, which is composed of a number of bones moveable one on another, and forming altogether a canal for the medulla oblongata, or spinal marrow. The limbs never exceed four, and are in pairs; but sometimes one pair is wanting, sometimes both. The blood is always red.

This great family is divided into four classes:—

1. Mammalia, or Mammiferous animals.
2. Aves, or Birds.
3. Reptilia, or Reptiles.
4. Pisces, or Fishes.

The first of these classes is the most interesting; it comprehends those animals whose organization is most developed, whose senses are the most delicate, whose intelligence is the most perfect, who are more

intimately connected with ourselves, who possess more of our attention, and are more essential to our immediate welfare; it comprehends man himself.

To the beings which belong to this class our observations will be exclusively confined.

As the class Mammalia (and it is the case throughout every other) contains groups of animals, which present common agreements in form and structure, and common dissimilarities from other groups, we are led naturally as it were, or by an involuntary operation of the mind, to institute a series of sections, in each of which those animals are thrown together which have a mutual resemblance to each other in certain prominent characteristics. These sections are termed *orders*. The following Table exhibits the arrangement of Cuvier, and most naturalists of the present day, and is that which is universally received.

TABLE OF THE ORDERS OF THE CLASS MAMMALIA.

SECTION I.

THE FINGERS AND TOES FURNISHED WITH NAILS.

Order I.—*Bimana*.

Extremities four; of which only the posterior are adapted for progression, and the anterior terminated by hands; the teeth are of three kinds; the body in its natural attitude vertical.

II.—*Quadrumana*.

The extremities four, all terminated by hands; the teeth of three kinds.

III.—*Carnivora.*

Extremities four: neither in this nor in the succeeding orders is there a thumb free and antagonising with fingers, and consequently no true hands; teeth of three kinds.

IV.—*Marsupialia.*

Teeth variable; body furnished with an external pouch for the reception of the young, the birth of which appears premature, and their organic developement imperfect.

V.—*Rodentia,* or *Glires.*

Extremities four; the teeth of two kinds, incisores and molares.

VI.—*Edentata.*

Teeth more or less deficient; the incisores always wanting, and sometimes both the canine and molares.

SECTION II.

FEET DEFENDED BY HOOFS.

ORDER VII.—*Pachydermata.*

Limbs four, and furnished with hoofed toes, variable in number; the stomach not constructed for ruminating; the body generally massive, and the skin thick.

VIII.—*Ruminantia.*

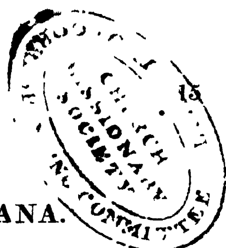
Limbs four, and terminating in two hoofed toes, (the feet being called cloven;) the teeth usually of two, but sometimes of three kinds; the stomach constructed for ruminating.

IX.—*Cetacea.*

Body constructed for inhabiting the water; limbs consisting of an anterior pair only, forming paddles or oars; the teeth variable—in some cases there are only horny laminæ instead.

Each *order*, as we have seen, is composed of an associated group, having certain essential points in common, which draw around it, so to speak, a line of circumvallation. Still in each *order*, thus constituted, numerous but minor points of difference exist, by which numbers may be mutually distinguished; and as many as thus agree are separated into *genera*. *Genera* include *species*, which have each their *especial* characteristics.





ORDER I.—BIMANA.

Extremities four; of which only the posterior are adapted for progression, and the anterior terminated by hands, the teeth are of three kinds; the body in its natural attitude vertical.

This order includes but one *genus*, and that *genus* but one *species*—Man.

"And God said, let us make man in our own image, after our own likeness." "So God created man in His own image, in the image of God created He him; male and female created He them."

Man was created the last and most excellent of God's mighty works. Confining our attention to him in a mere physical point of view he is the most perfect of all terrestrial beings; not, indeed, in size or animal strength, for in these qualities many excel him, but in the refined, the exalted plan and model upon which he is constructed. The eagle, it is true, may have a more powerful vision; the hare be more alive to every sound; the wild dog or vulture catch the faintest scent upon the gale; but in Man there is a nice balance, an adjustment, a felicitous accuracy of the senses, which thus expressly tend to his elevation and happiness; and, at the same time that they minister to his pleasure, enable him to obtain an intimate and minute acquaintance with the properties of the world around him. Hence the voice of melody; the colours of earth and sky; the odours of spring; the fruits of summer; the glorious sun, and the spangled canopy of heaven,

are sources of gratification and delight to him. Language, in which he can convey his wants, his desires, and the most abstract ideas of his mind, is his alone; and his alone are reason, and an immortal soul.

While, however, on the topic of Man's physical superiority, we cannot omit noticing a few circumstances, because peculiar to Man, at once proclaiming his dignity and his separation from inferior creatures; —we mean his attitude, the freedom and exquisite mechanism of his hands, and his natural deficiency in weapons of aggression or defence.

With the attitude of Man we naturally associate ideas of exaltation; and this attitude is in truth connected with his moral greatness; no quadruped approaches him in volume or extent of brain; and the blood necessary for an organ so developed is carried to it by arteries which do not subdivide as in most quadrupeds, but allow that full and free circulation its energies require: hence, an horizontal position would induce a perpetual liability to apoplexy, and render every bodily or mental exertion a hazardous experiment.

Man sustaining himself on his feet alone preserves the entire liberty of hands; and the situation of these organs is that which is best calculated to render them available as instruments of observation. But great as are the advantages derived from their liberty, more are attributable to their structure.

The human hand is strong and powerful, but at the same time exquisitely susceptible of impressions, and gifted with the most delicate tact. Every finger, except that called the ring finger, is capable of independent

movements, a power possessed by no other animals; and the thumb is so elongated as to meet readily the tips of any of the fingers; the fingers themselves, and especially the pulpy tips at their extremities, are freely supplied by a nervous tissue which communicates a discriminating sensibility peculiar to our race. Hence the admirable fitness of the hand for the prehension and examination of the minutest objects, and the precision with which its actions are executed.

Man possesses neither offensive nor defensive weapons; but this very deficiency adds to his improvement, inasmuch as it throws him back upon his internal resources, and calls forth the energies of his mind. His first step in civilization is to clear out a spot of ground for his dwelling; resist the inroads of the wild and ferocious animals; drive to a distance or exterminate the intractable; and subdue the more docile to himself. Art supplies the means which nature has withheld; and the rude hunter of the forest founds an abode, and rears a family to be the forefathers of a mighty nation.

Multiplying after the subsidence of the deluge, the human race has spread itself over every portion of the globe, and ramified into a thousand tongues and nations. Capable of inhabiting every climate, and in every situation surrounding himself with the necessaries of life, Man peoples the burning regions of the torrid zone, and the ice-girt shores of the arctic ocean. To him the mountain, the valley, the morass, and the desert, are alike; and, modifying his food according to locality, he thrives upon rice, and the plantain, and the palm-nut, on the plains of India; upon the raw flesh

and blubber of the seal, on the frozen snows of Greenland. Between these points there are innumerable grades and distinctions in habits, in manners, in food, in civilization, and moral qualities; but different as the tribes into which the human race is divided may appear, they may be ultimately reduced to about five standing varieties, the descendants of a common parent. These have been characterised as the *Caucasian*, which includes the nations of Europe, and such in ancient times as have been most distinguished for civilization and power; the *Mongolian*, to which are referred the mighty empires of China and Japan; the *Ethiopian*, occupying the interior of Africa; the *American*, and the *Malay*, which includes the natives of the peninsula of Malacca, and of Borneo, Java, and the isles of the Indian ocean; Australia, and the islands of the Pacific. To these, perhaps, some others may be added.

It were useless to inquire, and impossible to give any satisfactory solution, or theory, upon which to account for the hereditary characteristics which attach to these different varieties of mankind: climate, food, modes of life in remote ages, a primeval peculiarity in the original parents, which has continued itself to their latest descendants, or causes now unknown, and which have long ceased to operate, may have all in their turn contributed. One feature, however, which pervades human nature through all its varieties, in every age, in every nation, proclaims a common origin. History, however remotely we retrace its records, whether sacred or profane, discovers this trait in every page, and our own experience has made us acquainted with it: we mean the universal degeneracy of the human race; a fact

which, however men may have differed as to its cause, has in every generation been acknowledged, and, as if the memory of Eden still lingered on the earth, has been blended with a looking back to a traditionary period of innocence and purity before " all flesh had corrupted his way;" and the sage and the poet have alike lamented the long-passed golden age. But amidst the errors of the ancient philosophers and the vain speculations of the modern, the christian has a sure word of revelation, which at once clears up the mystery; and he learns that by one man's disobedience sin entered the world, and death by sin. Hence the scriptures may emphatically be said to contain an account of the Natural History of the Human Race, presenting us with our true origin and destiny. Who can read the affecting details, the touching histories, the striking narratives, which those records so simply and so beautifully portray, without feelings of sympathy and delight? Who can reflect, without admiration and instruction, upon the deep knowledge of human nature they unfold, from the time in which Adam fell, through successive ages, and in every condition of society;, to the times of primitive simplicity, when Abraham led his son Isaac up the mount of Moriah, thus shadowing forth a Saviour that should become an offering for sin; and up to the days of refinement and luxury, when Felix trembled on his throne, and Paul preached the " unknown God" at Athens.

The scriptures, thus interesting to our feelings, by the pictures of human characters and motives they display, contain subjects of a higher import, subjects more nearly connected with our eternal welfare: they alone teach the true nature of God, and of ourselves

as immortal beings; they alone give us an account of Man's first transgression and apostasy, by which a stain has been transmitted down the chain of human existence, contaminating every child of Adam, and bringing death into the world. Hence do they insist upon the necessity of a mediatorial sacrifice for sin; hence was the first promise given, "the Seed of the woman shall bruise the serpent's head;" hence the Messiah promised, who should destroy sin and death, to whom a series of prophets pointed, and whom Pilate crucified on Calvary. But until the coming of the Messiah, we learn that God ordered typical sacrifices of slain animals, through which, looking by faith to the antitype, Man might approach his offended Maker. Thus, without shedding of blood, there was no remission of sins till the Mediator came, who, "after He had offered *one sacrifice* for sins, for ever sat down at the right hand of God."

How long after the subsidence of the deluge the patriarchal religion and faith continued pure on the earth it is, perhaps, impossible to say; most probably but a short time, becoming more and more corrupted as nations diverged from the common stock: and yet as if every nation should, with an indication of its origin, preserve a remnant of the mode of worship appointed by God, and alone acceptable, as an accusing witness, we find the offering of sacrifices to have been a universal practice among all nations, a belief in the necessity of approach to Deity through a mediatorial altar surviving the wreck of their religion. Among the idolatrous heathens of the present day, among nations who forbid and abhor the ordinary slaughter even of the meanest animal, (considering all living

things as an emanation of Deity, and about to return into the essence of deity again,) this religious practice still prevails. Nor is it a little singular that the Bramins entertain a proverbial saying, not only similar in import, but in words, to that of the Jewish law—"Without shedding of blood there is no remission of sins."

Thus do we see that all nations, in ancient as well as in modern times, preserving the sacrificial mode of worship, however disfigured their religion might be with idolatry, concur in the necessity of a mediator through whom to approach offended Deity. But the Jews, to whom a clearer light was given, looked expressly forward to a Messiah, the subject of prophecy, the "rod out of the stem of Jesse," and the "Prince of Peace,"—a Messiah, whom their sacrifices, the scape-goat, and their many ceremonials, so evidently set forth. The Messiah came. "God sent his Son in the fulness of time;" but he was despised, rejected, and crucified, offering himself an oblation for the sins of the world, that "whosoever believeth on Him should not perish, but have everlasting life." "Surely He has borne *our* griefs, and carried *our* sorrows!"

Hence, as the holy prophets of old looked forward to the office and person of a promised Redeemer, whose days on earth were yet to come, do we, on the contrary, look back upon a finished work, a complete atonement, and recognise a Mediator who hath ascended the Holy of Holies, and ever liveth to make intercession for us, not with the blood of slain beasts, but by pleading his own blood and his own merits, according to "an everlasting covenant ordered in all things, and

sure." There is, however, this difference between the Christian and the pious Jew of old; that, whereas he saw indeed darkly, and through a glass, and beheld his Messiah in the dim visions of prophecy, we see with unbeclouded eyes, the dark sayings having been fulfilled, and the dim outline having been completed; so that our faith may repose on facts, which are matters of history, while his rested on the bare promise of things yet to come.

If under such circumstances, with the light of day around us, the Morning Star having arisen, we be found without faith, how doubly awful is our condition! "The soul that sinneth, it shall die." But Christ has endured this penalty; he has paid the forfeit of the bond; nay, he has magnified the law, and asks but our belief, our reliance, and our heart. "He that believeth in me shall have everlasting life." The Redeemer came not clothed with the terrors of omnipotence to destroy, but clad in mercy to save; and "though he was rich, yet for our sakes he became poor, that we, through his poverty, might be made rich;"—rich in that peace which passeth understanding; rich in the love of God, in the abiding influences of the Holy Spirit; rich in the bright prospect of a glorious eternity; and rich in the final inheritance of a mansion in the upper world, a house not made with hands, eternal in the heavens: there to mingle with the prophets and martyrs of old, and the spirits of the just made perfect. Thus, reader, may our faith be fixed on the Rock of ages, and our hopes full of immortality.

ORDER II.—QUADRUMANA.

The extremities four, all terminated by hands; the teeth of three kinds.—This Order is divided into two Genera—MONKEYS and LEMURS.

MONKEYS. *Simia.* LINNÆUS.

BETWEEN man and the creatures below him there is a vast hiatus or chasm, by which he is severed from them; nor is he only thus separated, but he is exalted upon a pinnacle far above them all. On his countenance and air are imprinted majesty and dominion: reason and speech, those sacred gifts of God, sanction his pre-eminenee, and forbid that it should be called usurpation. Hence, between the lowest savage, "that bends his bow, and lives upon the chase," and the brute that may be considered highest in the scale, there is an immeasurable distance. We are led to these observations because some, judging neither wisely nor well, have striven to reduce the human species to the same degrading level, or nearly so, with the singular animals of this order, which, notwithstanding their fancied resemblance, have little of even the "*masque*" of the human figure, and nothing of its motions and attitude.

It requires little philosophy to confute the fallacy of such doctrines, which have issued only from the atheist or the fool, and at once discriminate between man

made in the likeness of his Maker, a moral agent, a reasoning soul, and the ape whose boasted intelligence is scarcely above, some may think below that of the faithful dog. Writers and travellers, too credulous themselves, too fond of the marvellous, or designedly propagating falsehoods, have, it is true, misled even the learned with their wonderful accounts of "men with long tails, and covered with yellowish hair, navigating the ocean in boats, and bartering parrots in exchange for iron;" or of "long-armed hairy men," whose language was a hissing sound, acting the part of robbers and banditti. But such descriptions, which in charity we would refer to ignorance, credulity, and a heated fancy, have faded before science, and would now excite ridicule even in the nursery. But what shall we say of Bontius, a grave physician, who, in the description of an Ape, to which he assigns every grace and virtue, affirms the capability of these animals for language, which they would exercise were it not for the well grounded fear of being compelled to labour! What of Gassendi, who asserts, in behalf of some species of Ape, his aptitude for our attitude, actions, and dress; his discrimination and ear in music, and his capacity for learning the flute or guitar! Maupertuis longed for the brilliant and instructive conversation of the unsophisticated men with tails; and even Linnæus fancied a homo troglodytes but little lower than himself, and capable of progressive refinement. The best refutation of such fabulous nonsense is to present our readers with a description of a few of the leading species which have come under our personal observation, premising a few general remarks.

The Ape and Monkey tribes (*Simiæ* of LINN.) are exclusively confined to the warmer latitudes of the Old and New Continents, peopling in multitudes the deep forests of the torrid zone, and occasionally wandering for fruits or grain into the more cultivated portions of the adjacent districts. The only point of Europe in which any one of the species is found, in a wild state, is the rock of Gibraltar, where the Barbary Ape, an aboriginal of the opposite coast of Africa, appears to have become naturalized, most probably from individuals which at some period have been purposely introduced, or have escaped from confinement.

The almost illimitable number of distinct species comprehended by the genus Simia, has rendered a subdivision of it into subordinate groups not only convenient but necessary, inasmuch as they are characterized by essential points of difference. Of these several are peculiar to the Old Continent; others to the warmer regions of America: and it is worthy of remark, that these two portions of the globe possess their peculiar tribes; the Simiæ of the Old World being never found in America, and vice versâ. The American species may always be distinguished by the lateral position of the nostrils, between which there intervenes a considerable space: this is an invariable sign. Moreover, no transatlantic species has ever been discovered in which the tail is wanting; but, on the contrary, in many that organ is endowed with the singular power of prehension, a circumstance which never occurs in any species proper to Asia or Africa. Another peculiarity in many consists in the imperfection of the thumb, that portion of the hand being

reduced to a mere rudiment, and in some altogether wanting. These are known by the name of Spider Monkeys: on the ground they are awkward and embarrassed in their manners beyond measure, dragging themselves along with pain and difficulty, their loosely-jointed limbs apparently giving no support; but in the trees, on the other hand, they exhibit the most astonishing agility, suspending themselves by the tail, and swinging from one bough to another beyond their reach with inconceivable address, or traversing the smallest branches with the utmost ease and rapidity. Another singular tribe of American Monkeys are known by the name of Howlers; wild, ferocious, and untractable, they abound in large troops in the dense forests of Guiana and the Brazils, which, as night sets in, resound with their hideous and terrific yellings.

New Holland, among its singular animals, presents us with no Monkeys; and it is presumed that none are inhabitants of the large island of Madagascar. The Monkeys of the Old and New World form therefore two *subgenera*, each, as we have hinted, including numerous groups, from which we shall select the most striking examples as illustrative of our subject.

MONKEYS OF THE OLD WORLD.

THE ORANG-OUTAN. *Simia Satyrus.* LINN.



THIS celebrated species is a native of the islands of Borneo and Sumatra and the peninsula of Malacca, dwelling in the deepest recesses of forests of gigantic growth, and seldom venturing into the more thinly wooded districts: hence it is an object of curiosity even to the natives. Until within the last few years a great degree of obscurity has rested upon the Orang-Outan, as to its identity with the Pongo, which, however, is now ascertained to be the same species in the adult age, the young alone having been seen alive in Europe. The height of the full-grown animal has

been stated as at least equal to that of man, an assertion, however, to be received with some degree of hesitation, as it is not borne out by the skins or skeletons which have hitherto reached Europe. The height of the largest preserved specimen of the adult we have seen is about four feet; but we are aware of the description of one, by the late Dr. Abel, killed at Ramboon, the stature of which, according to the details which he laid before the Asiatic Society at Calcutta, January 5, 1825, must have exceeded seven feet.

The hair of the Orang is long, coarse, and of a brownish red; it covers the body and limbs, but is thinly scattered over the hands and feet: on the forearms its direction is upwards. In a very young individual of this species, which, while alive, came under notice, the hair was very dark, approaching black; but we have reasons to suspect that it becomes lighter as it advances in age. The forehead and face, as well as the palms of the hands and feet, are naked; the skin, where exposed, being somewhat lead-coloured.

The arms are of immense length, the hands long and narrow, the fingers slender, the thumb very short. The feet are also long, and resemble hands; the heel, however, projects: the great toe, or, as its true use would lead us to call it, hinder thumb, is also very short, and furnished in the male only with a small or imperfect nail, which appendage would seem not to exist in the female. The inferior extremities are very short, and bear a singular disproportion to the arms, whose extent of sweep is very great; like the arms, however, they have a peculiar freedom of motion, owing to a construction of the hip-joint, which allows

the head of the thigh-bone to rotate at liberty in the socket. In most animals (and it may be seen in those killed for food, as oxen, sheep, &c.) the head of the thigh-bone is tied down to the socket by a very strong ligament, termed *ligamentum teres,* one end of which is fixed on the top of the ball, the other in the bottom of the cup or hollow, and which, requiring to be cut or broken before separation of the bones can be effected, while it adds to strength and secures against frequent dislocation, diminishes in an equal ratio the extent of motion. But the Orang-Outan, as he does not walk on the ground, and so throw the weight of his body in leaping or running on that joint, does not require it to be tightly braced, but on the contrary that it should be allowed the utmost liberty; this ligament is therefore entirely wanting.

The body is stoutly built, very muscular, and the chest extremely capacious; but the belly is round and protuberant. During youth the forehead and skull appear well developed, and carry something of a human character; but, as the animal advances in age, the bones of the face expand, and, attaining their full dimensions, throw the skull backwards, giving the forehead so retreating an aspect as to take off every trace of resemblance to the human face divine; a resemblance which is still further diminished by the projecting muzzle, retreating chin, and lips capable of singular protrusion. The canine teeth are large and strong; the ears small; the throat swollen, the skin there being loose and folded: this skin envelopes a double membranous sac, communicating with the larynx or windpipe, and extending even below the collar bones.

These sacs are capable of being inflated at will to an enormous extent, which is the case when the animal expresses either anger or pleasure; but what may be the use of such an apparatus in its physical economy is unknown.

The eyes are rather close, dark, oval in figure, with large well defined eyelids fringed with lashes. The expression of the countenance is grave and melancholy, and accords with the character of the animal, which exhibits nothing of the petulance and restlessness so peculiar to the monkey tribe in general.

The Orang-Outan is essentially an inhabitant of the trees, the whole of its configuration and structure exhibiting the *beau ideal* of a climbing animal; indeed, he is utterly incapable of walking in an erect position; but when on the ground rests on his long arms, between which he drags his body forwards with an effort of difficulty and awkwardness. To view the Orang in his proper element, he must be seen in the woods of his own climate; it is there that he displays the most amazing address and vigour; the firmness of his grasp, the length of his sinewy arms, and the power of his muscles, combining to give him every advantage, so that he darts along from branch to branch, and tree to tree, with a rapidity which baffles pursuit.

We do not know whether the following anecdote is generally known or not, it may however be depended upon for its correctness, and we give it because it illustrates the manners and character of this extraordinary animal:—A gentleman, whose loss virtue and science will ever deplore, was out with a party of men in Sumatra, when in some trees, removed from the

dense forest, a female Orang, with a young one in its arms, was discovered; and the pursuit commenced. In the ardour of the moment, and excited by the hope of possessing an animal so rare, the gentleman forgot every thing but the prize before him, and urged on his men by the promise of a reward, should their exertions be successful. Thus stimulated, they followed up the chase; the animal, encumbered with her young one, making prodigious efforts to gain the dense and intricate recesses of the wood, springing from tree to tree, and endeavouring by every means to elude her pursuers. Several shots were fired; and at length one took fatal effect, the ball penetrating the right side of the chest. Feeling herself mortally wounded, and with the blood gushing from her mouth, she from that moment took no care of herself, but with a mother's feelings summoned up all her dying energies to save her young one. She threw it onwards over the tops of the trees, and from one branch to another, taking the most desperate leaps after it herself, and again facilitating its progress until the intricacy of the forest being nearly gained, its chances of success were sure. All this time the blood was flowing; but her efforts had been unabated, and it was only when her young one was on the point of attaining to a place of safety that she rested on one of the topmost branches of a gigantic tree. True to her ruling passion, even in death, she turned for a moment to gaze after her young one—reeled, and fell head foremost dead to the ground. The sight was so touching that it called forth the sympathy of the whole party. The eagerness of the chase subsided; but so deep an impression did the

maternal tenderness and unexpected self-devotion of the poor Orang make on the gentleman alluded to, whose heart was indeed formed in nature's gentlest mould, that he expressed the utmost remorse and pity, declaring that he would not go through the same scene again for all the world: nor did the tragical death of the animal cease to haunt his mind for many weeks; and he never afterwards recurred to it without feelings of emotion. The preserved skin is now in the Museum of the Zoological Society; an invaluable specimen.

As the Orang-Outan is grave and gentle in its manners, so it is more docile than any of the monkey tribe, easily imitating some of our actions; learning to use a spoon, and even a fork; and acquiring a relish for sweetmeats, coffee, or spirits. Fond of being noticed, it is capable also of great attachment.

A young individual of about four years of age, which came under our immediate notice, but which died a short time after its arrival in England, had, by its intelligence and docility, conciliated during its voyage the general favour of all on board. Accustomed to sit at table, it behaved with more decorum than many children, and used a spoon more dexterously. At a port where the vessel lay for some time on her homeward passage, the Orang was taken on shore, and it is supposed had once accompanied some of the men to the shop of a woman who sold coffee, which he found made so much to his taste, that he took the liberty of going to the same place alone every morning for his breakfast, which was given without hesitation; and thus he contracted a bill which the captain had to discharge. As a favourite he indulged the licence of

his character, and would at any time make free with the blankets of a sailor's hammock, converting them into a snug bed for himself; nor would he give them up without a struggle for the right of property. He was active to an amazing degree, and his strength was very great; for, young as he was, it required more than the power of one man to force asunder his grasp: his energies, however, were only exerted in play. There was but one person on board to whom he betrayed any antipathy; that was the butcher, for whom he entertained extreme terror, perhaps from having frequently seen him kill the animals for provision. He would approach that man with timid caution, minutely examine his hands finger by finger, and then endeavour to gain some friendly notice; but, on the least suspicious movement, or the sight of the knife, he would fly for refuge to some of his especial protectors, among whom he distinguished the cook. On arriving at our shore, the poor Orang began to pine and sicken, and, if raised up to take food, uttered a plaintive feeble cry, expressive of a desire to be undisturbed. After lingering a few days, he expired. This animal is also among the splendid collection in the Museum of the Zoological Society.

The Orang-Outan has been often confounded with other large species, and especially with one from Africa, the Chimpansé, (*Simia niger*, or *Homo troglodytes* of LINN.) sometimes called the African Orang. Of this animal in the adult age little or nothing is known. Two or three fine skeletons exist (one of which the author has personally inspected), which present anatomical differences between this and the Asiatic or true *Simia Satyrus*.

A young Chimpansé died lately in the possession of Mr. Cross; and a young specimen is also preserved in the Museum of the Zoological Society. The hair is black; the ears large; the proportion of the limbs is more human-like, the arms being shorter, and the lower extremities larger, than in the Simia Satyrus: the thumb of the hind foot is also much more developed; and, with the assistance of a stick, the Chimpansé is, we believe, capable of walking for a short time in the upright position. On the whole it is less decidedly formed as a climbing animal; but of its native manners we can give no account.

Having thus exhibited the Orang in the fairest light, as an animal not only interesting in itself, but as confessedly at the head of its tribe, we would here remark, before passing on to its inferior congeners, that, notwithstanding its intelligence, and the strength of its instinctive affection, it displays no ideas of moral right or wrong; no accusing or excusing conscience; no looking forward to another state of being. It has none of those moral perceptions which are implanted in the human heart, and which, however they may slumber in the savage, whose customs teach him to stifle the best feelings of our nature; or in the worse than savage, who, surrounded by religion and civilization, lives without God and hope,—are still there, still occupy an inalienable seat, and may be roused from lethargy to that state of active sensibility which, under the guidance of the Holy Spirit, will purify and exalt our nature. Hence, through the application of the gospel, in which, as in a mirror, we behold ourselves in a true light, are we led to the discovery of our utter

incapability of fulfilling the just commands of God, and the innate depravity of our own hearts transmitted to us as the stock of Adam, and are directed to lay hold by faith on Christ, and to esteem him as our only refuge, the way, the truth, and the life.

Next on the scale to the Orang succeed the GIBBONS, or Long-armed Apes *(Hylobates)*, between which and the former there exist but few points of difference. Furnished with a membranous sack, communicating with the larynx, but which however is single, they equally want the tail and the cheek-pouches which so peculiarly characterise the Monkeys of the Old World in general, from which they are further distinguished by their gravity and mildness of manners. Their native locality is confined to India and the large islands of the Indian Archipelago. As illustrative of the group, and as at the same time the rarest and most interesting, we select for our readers the

UNGKA APE of Sumatra. *(Hylobates Syndactyla.* ILL.) This singular animal inhabits the deep recesses of the woods which cover so large a portion of the islands of India, and, as far as we know, has never been brought alive to our British shores. Specimens of its skin, however, were brought over in the collection of the late Sir Stamford Raffles. In the gravity of its manners, and the mildness of its temper, it much resembles the orang-outan; but is considerably smaller in size, the total length of the adult, when standing upright, being about two feet four inches: its arms, however, have a disproportionate length to its stature, their span

extending four feet. Except on the face and palms,



the animal is entirely covered with stiff hair of a beautiful jet black; the skin beneath, as well as on the face, being of the same colour. The legs have the characteristic shortness which we see in the orang; the feet, which are long and well adapted for grasping, have the first and second toes closely united by a membrane as far as the last joint. It is, however, a better walker than the orang, and on a flat surface can manage to proceed in the erect position; but the gait is unsteady, and the hands are frequently placed upon the ground to assist in progression; but should the hands be not thus engaged, the arms are elevated perpendicularly over the head, with the hands depending from the wrist, as if to preserve the balance of the body, or to be in readiness for seizing any object above and within reach. The eyes are dark hazel; the ears small;

the air sack extends beneath the skin of the throat, from the chin to the breast-bone, but when uninflated is not manifest externally; it is distended when the animal is angry, at which time it utters a hollow barking noise, a tone apparently influenced by this apparatus. In one of the volumes of the Magazine of Natural History an account is given of the habits and manners of an adult male of this species, which died on board the ship Sophia during her homeward passage in 1830, and from which we learn that, although its favourite food was rice, plantains, carrots, sweetmeats, and onions, animal food was also eagerly accepted, fowls being especially preferred: "but a lizard having been caught on board and placed before him, he took it immediately in his paw, and greedily devoured it." Spirits and wine he refused: he would, however, drink tea, coffee, and chocolate. His temper was mild, affectionate, and in general not easily ruffled; when pleased, he would utter a chirping note; when irritated, a hollow barking noise; but when frightened or angry, the loud guttural sounds of *ra ra ra* were frequently repeated. The only annoyance he occasioned on board by his tricks resulted from his fondness for ink: he would drain the inkstand, and suck the pens as often as an opportunity was presented to him. Would that all in the use to which they have applied this fluid had done as little mischief!

Cheerful and very fond of play, he preferred children to adults, and became particularly attached to a little Papuan girl called Elau, a native of Erromango, one of the New Hebrides. They were often seen sitting near the capstan, the animal with its long paw round

her neck, lovingly eating biscuit together. With this child he would romp about the deck in mimic combat, now attacking, now eluding pursuit, and displaying various antics of address and agility, without losing his good temper for a moment.

There were several monkeys on board, with whom the Ungka was desirous of forming an acquaintance, no doubt in order to dissipate by their society the monotony of the voyage. The monkeys one and all would not, however, acknowledge him as belonging to their kindred, but rudely repelled his advances, indicating by their actions and chattering a decided hostility. Finding his endeavours ineffectual, and exasperated by their discourteous conduct, he determined to repay them in their own coin; so, one day after a storm of monkey insult, he swung himself by a rope towards the nearest, and seized his long tail, upon which he hauled away, until the delinquent extricated himself by his struggles. But having discovered this mode of retaliation, the Ungka persisted in it, and it often happened that he made his way up the rigging, dragging the monkey by the tail after him, and at the same time going through the whole scene with perfect gravity of countenance. At last, however, the monkeys united in so formidable a defence as to deter him from further aggression.

Impatient of confinement or solitude, he betrayed much anger whenever it became necessary to restrain his liberty; but his temper returned with his release. As if aware of the awkwardness of his mode of walking, and the difficulty he experienced of avoiding pursuit on the ground, his first object, in order to escape out

of reach, was to seize a rope and swing from his pursuer, or mount the rigging, where he would pass from rope to rope with astonishing quickness and agility, sometimes hanging by his hands, at others walking upright along the cords, keeping his balance true with his arms: he would also spring from one rope to another at a great distance, or drop from one aloft to another far below, seizing it in the fall with astonishing precision. Disappointment he could not endure; but, like human beings with sense and souls, was always best pleased to have his own way. When refused any thing which he coveted, he would display, says the writer of the narrative, "all the ebullitions of temper of a spoiled child, lie on the deck, throw his arms and legs in various directions, dash every thing about that might be within his reach, walk about and repeat the same scene as before, uttering his guttural notes of anger and offended pride."

Is not this a picture from life? In this ridiculous scene how truly may we behold ourselves! and although we hold this temper as displayed by the poor gibbon to be a fit subject for laughter, yet how often under losses and disappointments do we act a similar part, rebelling, murmuring, and striving against the dispensations of our heavenly Father, turning with indignation and wrath from his chastising hand, and, instead of inquiring into the causes for which God is dealing with us, and entreating His assistance in self-examination, and His grace to enable us to turn from the evil of our ways, or the sin that besets us, hardening our hearts, and becoming intractable as a bullock unaccustomed to the yoke. Thus it is with man, "who plays such fantastic tricks before high Heaven as make the angels

weep," and whose intercourse with his God is so little accompanied with a sense of utter dependence, and with that humility of spirit which is the grace and ornament of the christian character.

A scene of impotent rebellion and impatience towards a human being may be ridiculous in the ape; but in man, and a professed christian, towards God, it assumes another character; it aggravates his sins, it interposes a darker cloud betwixt him and his Maker, lays an additional burden on his conscience, and renders his feelings of repentance more bitter. Let us then apply the lesson to ourselves, and, while we think we stand, take heed lest we fall.

Leaving the orang-outan and gibbons, and yet confining ourselves to the continents of Asia and Africa, we come to a multitudinous family, the different species of which are comprehended under the general denomination of *Monkeys*, a race distinguished by adroitness, agility, restlessness, and curiosity. While young they possess considerable docility, and the mischief they commit seems to arise from their irrepressible buoyancy of spirit and perpetual restlessness. Cunning, inquisitive, and full of grimace, they have ever been general favourites, notwithstanding their acknowledged capriciousness. The wandering Swiss boy and his Monkey are sure to be surrounded by a group of motley gazers, whose laugh responds to every antic or grimace; and these animals in the cages of the menagerie are the centre of never-failing attraction: their mutual squabbles, their arch manœuvres to outwit each other, their ludicrous efforts to attract especial notice, and gain the expected boon, affording an un-

ceasing fund of entertainment. As age, however, or even maturity, advances, the character of the Monkey undergoes a material alteration; its vivacity, its docility, and its restless curiosity vanish; its petulance is exchanged for sullen moroseness; its sprightly activity for passive indolence, alternating with fits of rage on the slightest provocation. At all times keenly sensible of injury, and long remembering the aggressor, its vindictive disposition seems now doubly aggravated; so that the individual that feeds it, and to whom it has become familiar, is unsafe if he trusts too much to its forbearance.

It is but seldom that the Monkey attains to a period of advanced age, or even a moderate term of its natural duration, in our northern island: the keen winds, humid atmosphere, and sudden alternations of temperature, speedily inducing disease; so that an existence of two or three years is a fair average; and as the animals are usually brought over while very young, we are rarely permitted to trace them through the various stages of a life terminating at its natural period. It is true that under circumstances peculiarly favourable, instances of unusual longevity from time to time occur; but, on the other hand, numbers drag on, for a few months only, a wretched and painful existence. The prevailing disease which depopulates the monkey-cages of the menagerie is pulmonary consumption. By far the greater number of those, which it has been our lot to dissect, have exhibited before death the symptoms of this fatal malady, so truly the scourge of our country, and, as subsequent examination has proved, morbid appearances in the lungs and trachea, similar to what

we see in those of the human race, who are swept by this disease out of time into eternity.

The natural term of life of the various races of Monkeys in their native woods is not known with any certainty, nor what may be the diseases to which they are there subject.

The long-tailed Monkeys of the older continents, to which the name of *Guenons* has been given as a general appellation, have been subdivided into several smaller groups, distinguished by minor differences of little consequence. Their characters as a natural genus may be thus given: the muzzle slightly prominent, making the facial angle about 60°; as a general rule, pouches are continued from the inside of the cheeks, which serve as magazines for food; the tail is generally long, but incapable of grasping (a peculiarity restricted to some of the Monkeys of America.) Some of the subordinate groups are distinguished by the last molar tooth below having five tubercles on its crown, others four.

The species are extremely numerous, and offer every variety of size and colour. Living in troops or congregated families, they descend from their retreats among the woods and forest-covered hills to the cultivated fields and gardens, making great havoc and destruction. It is their custom to place sentinels on the watch, in order to give the alarm on the least appearance of danger: should they be unmolested, having first crammed their cheek-pouches with provision, they continue to feast during pleasure; on the intimation to retreat being sounded, they return as quickly as they can, loaded with their booty.

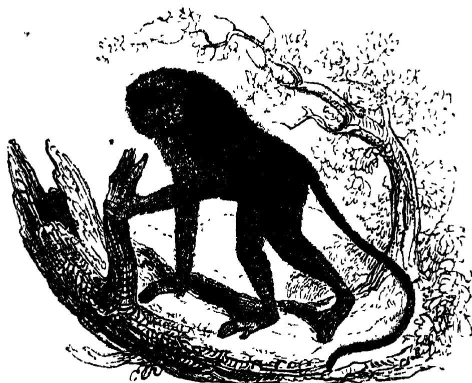
Although their general food consists of grain and

fruits, we have reason to believe that birds, small quadrupeds, reptiles, insects, and eggs, are also added to their diet.

Setting aside man, and the artificial means of destruction which he employs, there are few natural enemies from which the Monkey cannot escape. The most formidable and successful are the beasts of prey of the feline tribe, and the larger snakes, to which it often falls a victim. The eagle also will occasionally bear one off in her talons. Among the beasts of prey the leopard and panther are the most to be dreaded: the monkey is their favourite food; creeping catlike along the branches, they surprise it when asleep; or they lie in ambush among the leaves; or crouch at the river's brink, keeping up an incessant warfare, and affording a perpetual source of terror and caution. Thus is it with the christian: he is encompassed with enemies more malignant than the leopard, for not only does "Satan go about as a roaring lion seeking whom he may devour," but he bears a foe within—his own evil nature; against which he must be watchful and vigilant, and to overcome which he needs the grace of God, which is promised to all who seek in the appointed way. The world too is against him, endeavouring to ensnare him with its allurements; at every step he takes he finds the ministers of sin and pleasure waiting to pounce upon him; they lurk in the mart, in the counting-house, in the shop; they lurk in the splendid mansion, and in the humble cottage. Ambition crouches behind the monument of the patriot; ostentation in the bowers of charity; avarice in the gardens of industry;—How shall the christian escape? Christ has opened the way. His grace is all-sufficient.

To return to our subject. We have already stated the race of Monkeys to be extremely numerous as to species. To a long list, however, already described and recorded in the annals of science, others are added from time to time, as our researches extend. We shall therefore not endeavour to present the reader with a complete arrangement either of genera or species, but exercise our judgment in making an illustrative selection.

To the genus *Cercopithecus*, characterized by a facial angle of 60°, cheek-pouches, and four tubercles on the last molar tooth below, belongs the PATAS, or RED MONKEY. (*Cercopithecus ruber.*) This pretty animal



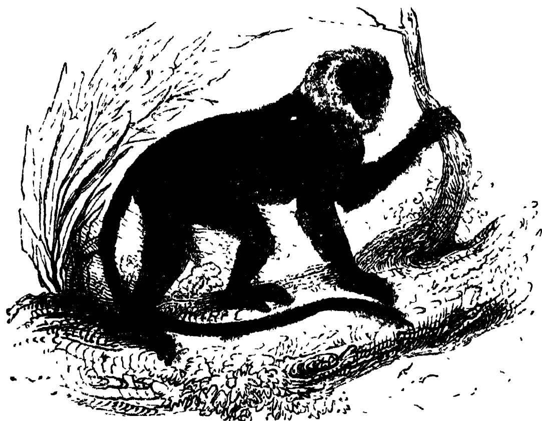
is a native of Senegal, and is rarely brought as a captive to England. In its temper it by no means offers a favourable specimen of its race, being violent and

malicious. Of its curiosity, love of mischief, and determined spirit of retaliation, we may form some idea from the account of an intelligent traveller, who tells us that while he and his party passed along the river in boats these Monkeys descended from the tops of the trees to the extremities of the branches for the purpose of a closer investigation, and for a time appeared much amused by the novel spectacle: not, however, being satisfied with remaining harmless spectators, they began a system of offensive operations, throwing pieces of wood and other missiles at the boats, and thus provoked an unequal contest. When fired upon they uttered frightful cries; and, although many fell, the courage of the survivors seemed in no way daunted; on the contrary, they redoubled their efforts, and persevered in the attack with the utmost zeal and resolution, displaying a degree of courage which among their fellow-tribes would secure them extensive privileges and rights of forest-denizenship.

The colour of this animal is a lively yellowish red, becoming paler beneath; a black band surmounted with white crosses the forehead above the eyes.

The Collared White-eyelid Monkey. *(Cercopithecus Æthiops.)* This species is a native of Africa, where Hasselquist mentions it as having been seen by him in his travels in Ethiopia; but, as it is imported from the western coast also, we may suppose it to be extensively distributed over the intertropical regions of that immense continent. Its general colour is a dull sooty black, with a broad white collar passing round the neck, and including the large bushy moustaches

which cover the cheeks; the eyelids are white also;



the crown of the head is of a fine rich chestnut, a circumstance which, with the white collar, alone distinguishes it from a closely-allied species (the common sooty or white-eyelid Monkey) brought from the same part of Africa, and agreeing in figure, manners, and disposition. The limbs are slender, but strong and vigorous; the tail is long, and thicker in proportion than is usually found to obtain in the group to which it belongs; the hair is long and soft; the two front teeth of the upper jaw are remarkable for their breadth, the canine for their prominence, circumstances which give an elongated form to the muzzle. Although curious and full of vivacity, the present species is less petulant and irascible than most, exhibiting a disposition, to a certain extent, docile and tractable: it is

therefore much esteemed, and not the less so for the singular grinning expression, indicative of its feelings, which its countenance perpetually assumes, and by which it exposes its teeth, producing a most grotesque and ludicrous effect. Its bite is very severe. It must, however, be acknowledged that the general uniformity of its forbearing temper (at least if the specimens which have fallen under our notice may afford a criterion) entitles it to confidence.

Africa supplies us with the DIANA and MONA MONKEYS, two of the most beautiful of their race. Of their native manners we have no certain account, except that they are said to dwell in troops among the woods on the mountains, sending spies before them when about to enter a cultivated district for the purpose of plunder, and, if intercepted in their retreat, defending themselves by throwing dust and stones in the eyes of their assailants. From the specimens of these animals which we have seen in captivity, we should consider them to be lively, good tempered, and playful: but it may be doubted whether this favourable disposition long continues.

The Diana is distinguished by a crescent-shaped bar of long white hairs ornamenting the forehead, and which, from a fancied resemblance to Dian's fabled bow, the moon in her quarter, has given rise to the name. The back is of a dark chestnut colour; the head, neck, sides, and under parts deep gray; the hands and ears black; the cheeks are tufted with white hairs, which end below the chin in a flat pointed beard; the chest is white also. The Mona is even

more elegantly marked. The top of its head is dark olive; the neck, back, and sides are chestnut brown, merging at the shoulders and haunches into a dusky slate colour, which prevails over the outside of the limbs and tail. The inside of the limbs and under surface of the body are pure white, separated from the darker colour by an abrupt line; a narrow crescent-shaped line of light gray surmounts the eyes; and the face is surrounded by bushy whiskers of a light straw colour, intermingled with a few dark rings.

To Africa must be likewise referred the GREEN MONKEY, *(Cercopithecus sabæus,)* a handsome species, and, as its name imports, of a general olive green, with black hands and face. It is a native of Senegal, where Adanson found it peopling the woods in immense numbers. From their colour and silence it was some time before he noticed them, hid as they were in the obscurity of the forest branches. They, however, forced themselves into notice by throwing boughs at him; nor were they at all frightened by the discharge of fire-arms, with which he returned their salute. He states himself to have killed twenty-three in less than an hour; a murderous destruction of animal life, in which we are sorry to find travellers too ready to indulge, and which can never be justified save by its necessity. Of the necessity in this case, or in that mentioned in our notice of the red monkey, we do not presume to judge; but we would raise our voice indignantly against cruelty, a crime against which God has denounced his anger; a crime which the christian must abhor who remembers his Lord's assurance, that

the works of His hand are all the objects of His care. Let not our young readers be guilty of ever injuring the meanest creature, nor by hardening their hearts, prepare themselves for guilt in their riper age.

Man is prone to run into extremes; and it often happens that while we are presented with some peculiar folly or criminal line of conduct, against which we raise our voice of censure, we are at the same moment called to contemplate an opposite course, carried out to so great an extent as to become doubly loaded with sin and its heavy curse. It is so here:—on the one hand we turn with disgust from a work of slaughter in which man, refined and polished man, stoops to engage; on the other, we see with pity and horror a fellow-immortal prostrating himself before an irrational animal which he has elevated upon a throne of idolatry, forgetting the only true God, degrading his rational faculties, and proving how far man may fall in his apostasy. The Monkey has been worshipped and held in sacred reverence as a divinity in the earliest ages: such was the case among the ancient Egyptians, who numbered it among their gods, with the ichneumon, the ibis, and many other animals. This strange and idolatrous people have long since passed away; and although their language has ceased among the tongues of the earth, their tombs, their sarcophagi, and their monuments, which seem to defy time, are a witness against them.

But idolatry, in which the worship of brutes is included, survives the wreck of nations, so consonant does it seem to the depravity of our nature. Did not the Israelites of old, with the miracles which God wrought

in their favour still fresh in their minds, with the commandments still sounding in their ears, and even while they knew that Moses was with God on the mount, rear the golden calf of idol homage in the very presence of Jehovah? The spirit of idolatry had infected them in Egypt, and its poison remained in them, although with a high hand God led them through the wilderness. Among several nations in India the worship of brutes, somewhat softened down perhaps in its more revolting features, still continues. To destroy life, at least the life of a brute at all, is accounted a sin among the brahmins. They do not, however, stop here; but hold many animals in sacred reverence and homage. The brahmin bull, of which a very fine specimen exists in the Zoological Gardens, is a well known example. To this must be added, we believe, more than one species of the Monkey. Perhaps, young reader, you may wonder that man, notwithstanding his degraded state, and his ignorance of that pure and holy faith which has enlightened *your* mind, should be so far dead to the natural dictates of reason as to make such a brute the object of adoration. "These be thy gods, O Israel, which have brought thee out of the land of Egypt!" said a stiff-necked and rebellious people. Why wonder? for the heart of man is desperately wicked. But, reader, while you are walking in the light, and are cheered by the beams of the gospel dispensation, let us inquire, have *you* no *idol?* Idol worship does not only consist in the gross folly and sin, which so pervade the dark regions of the earth, but also in giving our supreme affections to any thing but God. Self-love, friends, property,

pleasure, gold, silver,—these are the idols before which christians in name bow by thousands—these which flee away like shadows—these which fade in the enjoyment. Look then into the recesses of your own heart, and if you can say, " Thou art my God ;" " Thou art my portion;" let His be all the praise. But, in pity for those who are in the darkness of ignorance, and know not the Lord Jesus Christ, evince the purity of your faith by your endeavours to spread that knowledge which shall one day " cover the earth."

The species of Monkey so blindly reverenced in India is the ENTELLUS. (*Semnopithecus Entellus.*) One



of the most common monkeys in Hindostan and the islands of the Indian Archipelago, the Entellus is an animal of very rare occurrence in the menageries of

Europe. We only know of a single individual having been brought alive to England, and this was in the collection of the Zoological Society: it however shortly died, unable to endure the cold, of which it was extremely susceptible, and is now preserved in the Museum of that institution.

In India this species congregates in multitudes, which, emboldened by the respect and forbearance uniformly experienced, infest the skirts of towns, villages, orchards, gardens, and cultivated grounds, where they commit great devastation. With perfect nonchalance they appropriate to themselves the produce of the labourer's toil, and exercise their discrimination in the selection of the choicest fruits, while the superstitious possessor, unwilling or afraid to expel them by force, with great submission remains a passive spectator!

We introduce this specimen not only on account of its scarceness in Europe, and the reverence it obtains in Bengal, but because it is a characteristic specimen of a group, to which Mons. F. Cuvier has given the generic name of *Semnopithecus,* (from Σεμνος, *to be held in veneration,* and Πιθηξ, *a Monkey,)* a group distinguished by many particulars which ally it to the gibbons. In the shape of the head and expression of the physiognomy there is a close similarity. Like the gibbons the Monkeys of this group have a fifth tubercle on the crown of the last molar tooth in the lower jaw. The cheek-pouches are wanting, or, where found, so small as scarcely to deserve the name. The body is slightly made; the limbs long and slender. The tail is of great length, considerably exceeding that of the body.

When taken at an early age, the Entellus Monkey is familiar, playful, and very agile; yet gentle, and devoid of petulance or malice. Its temper and disposition, however, alter materially as its age advances, a listless apathy and mistrust supervening, with a propensity to obtain its end by force rather than by the exercise of ingenuity or cunning. The colour of the Entellus easily distinguishes it from every other species: the ears, face, and hands, are black; the fingers long and slender, but the thumb short; the forehead is garnished with a row of stiff black hairs projecting forwards; the face is encircled by a tuft of grayish white, meeting under the chin in the form of a pointed beard; the general colour of the body is an ashy gray, with a slight tinge of straw colour, becoming pale on the inside of the limbs and under surface. The height of the young specimen from which our description was taken is between two and three feet. It is, however, said to grow much larger.

We might select many more from the catalogue with which to gratify our readers. We can only refer them to the most conspicuous; and among these especially the PROBOSCIS MONKEY, a large species from Cochin-China, distinguished by its long nose, which impresses upon its features a striking caricature of the human countenance. The WANDEROU, covered with long black glossy hair, which contrasts very singularly with its large gray and bushy beard surrounding the whole of the head and face, and giving it an imposing air of gravity and wisdom. The BONNET MONKEY, with the hair on the top of the head disposed in rays,

diverging from a centre, so as to form the resemblance of a Chinese cap. To these others might be added. We shall, however, proceed to the Baboons, the most brutal, ferocious, and disgusting of the tribe. They exhibit nothing of the gentleness and sagacity of the orang-outan or gibbons, nothing of the lively and playful, although petulant vivacity of the monkeys: their revolting characteristics are unmixed with any ameliorating feature; and the hideous expression of the face accords most thoroughly with the disposition. Attaining to a large size, and possessing vast strength, they are extremely formidable, and, except when very young, cannot be taken alive. The muzzle is elongated into the form of a snout; the eyes are small, close set, and deeply sunk, with a horribly sinister expression; the canine teeth are of immense size; the skull is contracted; the cheeks furnished with large pouches for provision; the tail is short, but varies in different species. Confined chiefly if not entirely to the hottest parts of Africa, where they are dreaded by the natives, they hold almost unlimited dominion in the deep forest, or among the rocky and wooded mountains, few animals, except the leopard, panther, or lion, being able to contend against their strength and ferocity. In confinement they have been known to give way to paroxysms of fury, raised to such a pitch as to become the cause of death, and have dropped down and expired from the overwhelming violence of the emotion. Vindictive to the utmost, and jealous of the slightest offence, their keeper is never safe, and several instances are recorded in which the incautious attendant has either been destroyed or rescued with the

greatest difficulty. A case of the former kind occurred some years ago at Paris; the man, it is supposed in play, was struggling with a female belonging to the establishment, close by the den of a large Mandrill, which she had been accustomed to feed and notice; its rage was immediately excited, and, by a violent exertion of strength, it forced asunder the bars so as to allow its arms to be stretched out, and, before the man was aware, grasped his neck with its sinewy hands, and strangled him before assistance could be procured.

The MANDRILL. (*Cynocephalus Mormon.*) Of this ferocious tribe the Mandrill is the most prominent example.



This extraordinary and hideous animal is a native of Guinea, where it attains to a stature nearly equalling

that of man. Its bulk, however, in proportion to its height, is very great, the muscles of its shoulders, neck, and arms having a prodigious volume. From its great powers and ferocity the Mandrill, when wild, is one of the most formidable of animals. In confinement its likings and antipathies seem the result of mere caprice. On the approach of certain individuals, without any manifest cause, it will display the most violent fury, shake the bars of its cage, and evince the malignity of its feelings by expressive gestures and actions. The least indication of timidity on the part of a spectator will immediately elicit a similar demonstration; as if the brute, aware of the fear his very appearance had inspired, felt instinctively propelled to follow up the effect. Such we believe to be its manners when wild in its native climate; for, notwithstanding its powers and ferocity, it is still a coward, and when boldly opposed will not make a close attack, keeping up the warfare with missiles unless danger presses, and no other means are in its power. Should, however, its presence produce terror and flight, instead of determined opposition, the consequences would be almost inevitable destruction.

Although the food of the Mandrill, like that of the monkey, consists of fruit, grain, and roots, still we have good reason to believe that flesh forms an essential part of its subsistence. The individuals with which we have been acquainted have all manifested a fondness for animal diet. A sufficiently conclusive experiment was, however, some months since made in the presence of a scientific gentleman, who related it to us, and which confirms the opinion. The animal was first

tried with a live bird, which he immediately destroyed by a bite, stripped of its feathers, and devoured. A rabbit was next given; and this he also killed instantly by a bite across the back, and proceeded to devour, but was not permitted. A young one of this species, which died lately in the Zoological Gardens during dentition, was always supplied with boiled meat in addition to vegetables, which it relished exceedingly. How early the native disposition of the Mandrill begins to develope itself was made fully manifest in this individual: notwithstanding its youth, it exhibited an insolence and capriciousness which would have grown with its growth, and strengthened with its strength. And is not this similar to what we see in the human race around us? The vices which show themselves in childhood, like the first small buddings of the tree in spring, unless checked on their first appearance by the pious care, reproof, and instructions of parents or teachers, applied by the grace of God to the heart, become daily more and more unfolded; and as the bud expands into leaves, and flowers, and fruit, so do the evil propensities of our nature increase with rank luxuriance: but their flowers have the odour of death, and their fruit the bitterness of perdition.

In the menagerie of Mr. Cross a splendid specimen of the Mandrill was lately exhibited: his height appeared nearly five feet; and his strength, especially in the upper parts of the body, tremendous. Jerry, for such was his familiar cognomen, was a great favourite; he was accommodated with a chair in his den, on which he was accustomed to sit, taking his porter and smoking his pipe with a singular air of gravity and

satisfaction. The diet to which he gave the preference was cooked vegetables and meat: we understand also that he once dined on hashed venison before the late king. Notwithstanding all these accomplishments, he was still the Mandrill; his voice was harsh and guttural; the expression which ever lurked in his eyes, even in the calmest moments, betrayed the brutal savage. In his appearance there was much to astonish or alarm, but nothing to please or attract. The general colour of this species is an olive brown; the hair on the top of the head forms a tuft; the forehead projects in an acute ridge over the eyes; the cheeks are elevated on each side, *by a singular developement of the bone which forms a socket for the roots of the immense canine teeth,* furrowed also obliquely, and of a rich violet blue; a vermilion line begins a little above the eyes, runs down the nose, and spreads over the lip the nostrils are large; the lips bearded; the hands are small, taper, and well made. Many tales, probably much exaggerated, are told of this animal in Guinea; and he is said to carry off the negro women into the impenetrable recesses of the forests. The dread entertained by the natives may give rise to the account.

Having entered thus fully into the habits of this animal, as illustrative of the baboons in general, whose characters, modified by size and strength, are universally the same, we shall not attempt to introduce another example, but pass on to a review of that great division of the monkey race confined to the continent of America, and which differs in certain points and features from the quadrumana of India and Africa.

The monkeys of America may be divided into two leading groups: the SAPAJOUS, and the SAGOINS.

The Sapajous have four grinders more than other monkeys, thirty-six in all; the tail is long, and capable of being twisted round any object so as to grasp it like a hand; the nostrils are wide apart, having a lateral position; and the contour of the skull is round. Some of the species are distinguished by an indomitable wildness and ferocity; others, timid and listless in their natural freedom, are docile and affectionate in captivity. Without suffering the minute details of the subject, and the many minor subdivisions, which are often both useless and tiresome, to detain us, we shall endeavour, while keeping to a systematic outline, to exhibit those points which convey a true and ''rcible illustration.

There are, as we have intimated, no baboons in the American continent; but their place would seem to be supplied by a family of the Sapajous, allied to them, if not in external characters, at least in nature and disposition. They are known by the name of Howlers. Many of the species attain to a considerable size, and, from their ferocity and strength, are very formidable. They live in large troops, and increase the terror which their presence is calculated to inspire by the most tremendous yelling, produced in concert, and chiefly at night, till the forests resound. The frightful voice " these animals is the result of a peculiar anatomical ıstruction of the windpipe, so adapted as to increase volume; within the ascending branches of the lower w, which are very high, there is lodged a bony drum or barrel, formed by an inflation of a bone connected

with the larynx, and known to anatomists by the name of *os hyoïdes;* in this the reverberation takes place. The tail in every species is long, and has the under surface naked, so as to be capable of nicer application in grasping: to this peculiarity another may be added, namely, that when the tail is extended, it naturally, and without any voluntary effort, forms a hook-like curve at its extremity, in the same manner as the claws of a bird contract and grasp firmly, solely by the bending of the leg and sinking down of the body in the natural posture of rest on a twig or perch. In both cases, too, the design is the same—security during sleep, as well as to allow the attention to be directed to other things, while the position of safety is maintained firmly and involuntarily. Our reader will here perceive how these are beautiful instances of the adaptation of means to a given end. To the philosopher the contemplation is replete with delight and satisfaction, as it raises him from the creature to the Creator, whose tender mercies are over all His works; for these are points which prove that His mighty plan is not confined to a great outline only, but extends itself to the utmost minutiæ connected with the well being of every living thing.

Why there should exist these differences of structure between the Monkeys of the Old World and their transatlantic relatives, we cannot presume to say; but if in an investigation of nature the mind is so soon beyond its depth, what must it be when it endeavours to penetrate the mysteries of the Eternal Cause?

To our account of the Howlers *(Mycetes,)* we may add, that they are natives of Guiana and the inter-tropical regions of America; but with regard to the

differences by which the species are determined, much confusion yet exists from the variation of colour occasioned by age and sex. Among those, however, which are clearly made out, may be numbered the GUARIBA HOWLER *(Mycetes fascus,)* an inhabitant of the deserts and wooded solitudes of Brazil. The RED HOWLER *(M. seniculus,)* of Guiana, a fierce species, dwelling in troops, and noted for the stentorian power of its voice. The CARAYA of Brazil, *(M. Caraya;)* and a few others. They are all intractable and ferocious. Their activity is very great, so that it is difficult to secure them alive; and indeed, according to Azara, it is scarcely less so to obtain them with the gun; for when wounded they immediately coil the tail round one of the highest branches of the tree, and hang by it with the head downwards for days after death, in fact until decomposition begins to take effect.

Next to the Howlers are classed the CAPUCHIN MONKEYS *(Cebus,)* distinguished by the roundness of the skull, the short muzzle, and grasping tail, but which is notwithstanding covered with hair throughout on its under surface. The principal examples are the WHITE-FACED CAPUCHIN; the WEEPER *(C. Apella;)* the GRAY SAJOU *(C. griseus;)* the BEARDED *(C. barbatus;)* the OUAVAPAVI *(C. albifrons;)* and many more; all natives of the warmer parts of South America.

Of this group one of the most curious is the HORNED MONKEY. *(Cebus fatuellus.)* It is a species growing to a considerable size; but in its manners is gentle and tractable. Its name is taken from two strong brushes

of hair elevated from the base of the forehead, producing a resemblance to horns. The general colour is a sooty brown, becoming black on the head and limbs; the under parts are red; a bandeau of hair passes across the forehead, terminated by the elevated brushes which rise to a point. These mimic horns do not appear until the animal is fully adult. The skin is of a violet blue. It is a native of Guiana.

Among the most singular and extraordinary Sapajous, or grasping-tailed monkeys of America, are a group termed Spider Monkeys; whose awkward trailing mode of progression on the ground, together with the length, slenderness, and pliancy of their limbs, has obtained for them this appellation. The scientific name of the genus is *Ateles*, (Ατελης, *imperfect*) from the construction of the hand, in which the thumb is either totally wanting, or merely rudimentary. These are animals essentially formed for the trees. The tail is very long, and possesses not only the power of grasping in an astonishing degree; but, from the circumstances of the under surface being covered with a naked skin of exquisite sensibility, it may be indeed considered as an additional hand. Suspended by this member only, they will swing backwards and forwards, or launch themselves to a distant branch with great dexterity. Their long limbs are so flexible, and capable of being thrown into such positions, as to make them seem almost disjointed; hence they are never at a loss among the branches, where, instead of displaying the same embarrassment which characterizes them on the ground, they exhibit the most surprising feats of

address and activity. The remote parts of the forest are their resort, where they frequent the tallest trees in large troops, and mutually succour each other in the moment of danger, uttering lamentable cries when hunted or hurt. Should an individual be wounded, he puts his hand to the part, and gazes quietly at the blood as it flows, till he sinks and expires. In captivity they are very gentle, and free from petulance or malice, exhibiting an aspect, if not of apathy, of plaintive melancholy.

In the Gardens of the Zoological Society the curious reader will find three individuals of this singular group, of which two are of the same species, namely, the BLACK



(Ateles ater,) the other a lately discovered species, and called the WHITE-FRONTED SPIDER MONKEY *(A. frontalis.)* The attenuated form of the body, covered with

long jet-black hair, the length and flexibility of their limbs, the readiness and power of the tail, and the strange contortions they assume, with the serious expression of the countenance, place them among the most striking objects of the collection. When at rest, a favourite position is that of folding the arms across the chest, and laying each hand upon the opposite shoulder, while the tail is entwined around the perch. Although by no means spiteful or mischievous, they are very apt, as we have frequently seen, to stretch their arms out between the bars of the cage, and snatch a riband or other ornament from a lady's bonnet, ponder over it with a look of grave scrutiny, and then, as if deeming it worthless, or unable to form any conjecture respecting it, throw it down, or retain it in the grasp of the tail for a future examination.

The SAGOINS comprehend several groups of American monkeys, which, although differing from each other in many points, agree in this; that the tail (unlike that of the preceding genera) is altogether incapable of grasping. In habits and disposition they are irritable, but lively, and very timid; and their actions bear more resemblance to those of squirrels than of monkeys. Light, airy, and graceful, they are by far the most beautiful of their race, becoming favourites in captivity, and much valued even in their own country. They live in troops among the branches, eating fruit, eggs, young birds, and especially insects, which constitute a principal part of their food.

The SQUIRREL MONKEY, or Saimiri of Buffon, *(Callithrix sciureus,)* is a beautiful little animal, which we

give as an example of the genus Callithrix, having, as the distinguishing characters, a rounded form of head, short muzzle, very large ears, and tail covered with hair. The native country of the Squirrel Monkey is Brazil, Cayenne, &c. It is a gentle, lively, little animal; measuring about a foot in length, and of an olive gray colour on the body; the face is black; the fore-arms and the legs a fine orange red; the four hands are formed with great exactness, the nails of the thumbs being large and flat, and those of the fingers straight; it is, however, in the hind feet only that the thumb is opposable to the fingers. Although the tail is not prehensile, and never used for the purpose of handling; yet, according to an account of this animal by M. F. Cuvier, it would seem to be habitually employed to wind round objects, if not for the purpose of adding to security by a firm grasp, at least of acting as a feeler or support. The Saimiri may, therefore, be regarded as forming a link between this and the preceding division; proving, among many other evidences, that in the chain of nature there is no disruption, but that all is harmony and order; the link that succeeds differing from that above by imperceptible shades, which become stronger and stronger as we pass along the series of concatenations; so that however dissimilar the links at a distance from each other may be, there will exist a middle point between them where they blend in unison. To our description of the present animal we may add, that it is accustomed to sleep in a sitting posture, with the head bent over between the legs; and that its cry is a kind of hissing sound, or slender

whistle, repeated three or four times, and expressive of impatience or anger.

The SAKIS form another genus of the Sagoins, characterized not only by the rounded form of the head, but by the bushy fox-like tail. Among the most remarkable is that called by M. Humboldt the ORONOCO CAPUCHIN, or Hand-drinker, (*Pithecia cheiropotes*), a species distinguished by two distinct bushy tufts, formed by the parting of the hair above the eyes, and by the long black beard of crisped hair which rises below the ears and hangs over the chest. The canine teeth are of enormous length and size; the nostrils far apart; the eyes large and deeply seated; the nails bent with the exception of that on the thumb, which is flat and round; the tail is very bushy; its fur is of a reddish chestnut colour. The expression of its countenance is that of melancholy mixed with ferocity; and its character, according to the accounts received, for it has never been brought alive to Europe, is in accordance with its aspect. Fierce, wild, and active, it is impatient of confinement; and, unlike the Sagoins in general, will make a furious assault when irritated; at the same time manifesting its displeasure by rubbing its beard violently, and grinding its teeth in a manner too expressive to be misunderstood.

A singular circumstance connected with this animal is its manner of taking liquids, so different from that of other monkeys, and from which its appellation is derived. It seldom drinks; but when it does, instead of applying its lips to the liquid, or to the vessel containing it, the liquid is taken into the hollow of the

hand, and conveyed thus to the mouth, while the head is inclined on one shoulder. It appears to have a great aversion to the beard being wetted.

The present species is one of the very few of this order which choose a solitary life: instead of congregating in troops, it lives in pairs only, and is very shy and retiring.

The CACAJAO (*Pithecia melanocephala*), a species found on the banks of the Cassiquiaire and Rio Negro, belongs to the present genus, and is distinguished by its brown fur, short tail, and black head. It appears to be a weak, inactive, but docile little animal, much annoyed by the petulance of other monkeys, which disturbs the natural quiet of its disposition; and when at length irritated, which is but seldom, the feeling is displayed by a ludicrously distorted expression of countenance like a convulsive laugh. It has none of the active dexterity of its order, but is altogether awkward and inanimate.

Another of this genus is the WIDOW MONKEY (*Pithecia lugens*), so called from the contrast of black and white, which its natural dress displays. Its colour is uniformly black, with the exception of the fore-hands, face, and neck, which are whitish; the face being surrounded with a narrow belt of purer white: hence the creoles of South America say that it wears the veil, kerchief, and gloves of widowhood, according to the custom there. It is a pretty, lively, and gentle animal; but, like the cat, conceals beneath a promising exterior a fierce spirit and carnivorous appetite, small birds

being its favourite food, in the capture of which it exhibits the mixture of sly cunning, address, and activity, which so much characterize that animal. Of other monkeys it appears to stand in great fear.

Of all this numerous race the OUISTITIS *(Jacchus)* constitute the most interesting genus. Squirrel-like in their habits and manners, they are active and lively, although timid, and extremely delicate. Natives of the warm regions of South America, they will not bear the cold of our climate without the utmost care, requiring an even temperature to be perpetually maintained.

The species most commonly seen in captivity in England is the STRIATED OUISTITI, or Marmozeet, *(Jacchus vulgaris,)* a pretty little creature, with the tail ringed alternately brown and white, a gray body, and two large tufts of white hairs standing out before the ears. Although so sensible of cold, several instances are known of its having produced young in captivity. M. F. Cuvier gives an account of one in the menagerie at Paris, which in April, 1819, had three young ones at a birth; and the pair now in the Zoological Gardens have bred during the present year 1832, producing twins, but which soon died, apparently from deficiency of nutriment on the part of the mother. If a judgment may be formed from the specimens referred to in the Zoological Gardens, the Ouistiti does not seem a very intelligent little animal, as these manifest none of that restless curiosity and archness so characteristic of the race: instead of courting the attention of visiters as

the rest, they seem annoyed by their presence, and glad to escape from their curiosity. To keep themselves warm, as well perhaps as to screen themselves from observation, they will crouch together in the cage, covering themselves with wool or soft materials, and peep out with a timid air, but never make any advances towards familiarity. Their voice is a sharp whistling cry, repeated when irritated or alarmed.

In the first number of the Magazine of Natural History we are favoured with a notice of one of these animals, procured in Brazil, which, with its timidity, manifested a fierce and wild spirit, "screeching most vehemently when any one dared to approach it;" and "it was long before it was so reconciled, even to those who fed it, as to allow the slightest liberty;" the most gentle attempt exciting its anger. "Its sense of hearing appeared to be excessively acute, so that the slightest whisper was sure to arouse it." Its favourite food on board was cockroaches, of which it "would eat a score of the largest kind and a great number of the smaller ones three or four times a day," rejecting the wing-cases and legs. In addition to these, the diet was fruit, milk and bread, &c.

We may here observe that insects seem a favourite food with all monkeys, but especially with those from South America, which, as we have often seen, will hunt for them with amusing eagerness.

To this genus belongs the Titi of the Oronoco, a beautiful little animal, scarcely a foot in length, with the fur of a golden yellow, exhaling a faint odour of

musk. In its movements it is light, airy, and graceful; in its manners gentle and inoffensive. A stranger to irritation or anger, its countenance expresses tranquillity and gladness. It is said to have a singular habit of watching the lips of a person while speaking, which, if allowed to sit on the shoulder, it will frequently touch. Peculiarly susceptible of changes of temperature, even in its own climate, it can ill bear our northern regions. In its native woods, during cold or damp weather, it assembles in clusters on a branch or tree, all crowding closely together and embracing each other with their arms and tails, so as to secure as much warmth as possible.

We may also here notice the MARIKINA, or Silky Monkey, a beautiful and delicate little animal, and, like the rest of the Ouistitis, difficult to preserve alive in a climate like ours. In its own country, South America, the Marikina is kept as a pet by the ladies, and highly esteemed for its elegance and docility. Neatness and cleanliness to a fastidious degree are said to be characteristic traits in its disposition, the slightest degree of dirt annoying it so greatly as to produce melancholy, loss of appetite, and death. It is also impatient of solitude, and pines if deprived of companions of its own species; it is therefore usual to keep the Marikina in pairs, as the most certain means of preserving it, not only in health, but in cheerfulness and comfort. The colour of the fur is a golden red. The length of this species is about a foot, exclusive of the tail, which is equal to the body. Although the

hands are used in handling, there is no distinct thumb; in fact, the actions of this animal, as of all of its genus, have a close resemblance to those of squirrels.

Leaving the monkeys, we pass by a very natural transition to a singular race, which form the ultimate grade of the quadrumanous animals, connecting them to the genuine quadrupeds. They are known by the appellation of *Lemurs*, a name which, in consequence of their generally nocturnal habits, was given them by Linnæus, in reference to Roman mythology, *lemures* signifying ghosts. The Lemurs are all natives of Madagascar, in which they occupy the station of monkeys in other parts of the world; for it is not a little singular that in this island, so adjacent to Africa, so wooded, and apparently so favourable in temperature for being a chosen locality, not a single species of the tribe exists. Their place, however, as we have said, is occupied by the lemurs, which are indigenous to this island, having never been themselves discovered elsewhere.

It is here worthy of observation, that the laws by which the distribution of animals is regulated are still enveloped in much mystery. For instance, to elucidate our meaning, let us take a survey of India and the islands of the Indian Archipelago; how thronged do we find the woods and jungles with deer, and buffaloes, and zebus, the tiger, the lion, and the panther, with the orang-outan, gibbons, and monkeys innumerable. Borneo, Java, Sumatra, and the surrounding smaller isles, are all replete with these or allied species; but pass on to Australia, a new race presents itself; a race

differing most widely from the races of India and her islands, not only in *species*, but in *genus* and *order*. With the exception of the wild dog, which is with reason supposed to be an introduction, and that of a comparatively late period, there is no quadruped there at all resembling those of the nearest continent. In the woods are phalangers and opossums; on the plains, kangaroos; in the morasses, ornithorynchi; but the deer, the tiger, and the wild ox do not exist. Temperature will not account for facts like these, for in the mountains of India deer and tigers abound along the borders of the line of snow. But thus it is that we are daily taught our own ignorance, and that we know even in nature but a part of His ways. "Knowest thou the time when the wild goats of the rock bring forth? or canst thou mark when the hinds do calve?" "Who hath sent out the wild ass free? or who hath loosed the bands of the wild ass?"

To return. The Lemurs are a race by no means remarkable for intelligence: their disposition, however, is gentle, and their habits active; but they manifest neither the sprightly vivacity, nor the cunning, nor the curiosity of the monkeys; to which, although quadrumanous, (four-handed,) they bear but a distant resemblance in form. Their muzzle is in general long and pointed; their fur woolly; the thumbs both on the anterior and posterior limbs are well developed and antagonise with the fingers, but those of the posterior are large and remarkably expanded at the tips; the nails at the extremities of the fingers are flat, excepting on the first finger of each of the hinder limbs, where they are long, raised, and pointed. Their teeth exhibit

the indications of sharp tubercles fitting into each other when the jaws are closed, as is characteristic of insectivorous quadrupeds.

The true Lemurs have six slender incisor teeth below, set close together, and projecting forwards; four above, straight, and the intermediate ones separated one from the other; the canine teeth are long, pointed, and cutting on their posterior edge; the molar teeth are six on each side in both jaws.

Among these singular and imperfectly known animals there is but little difference, except as it regards colour; the habits, manners, and general figure of every species being the same. In captivity they can hardly be said to exhibit any marks of attachment to the person most familiar to them; but, on the other hand, they are gentle to strangers, not easily irritated, and seldom bite; when they do, the wound from the length and cutting edge of the canine teeth is very serious. Their habits are evidently nocturnal; during the greatest part of the day they rest dozing on their perch, and, if two are together, they embrace each other with their arms and long tails, twisting the latter between the legs, and then coiling it round the body, at the same time that the head is bent down between the arms, so that they present the appearance of a single woolly animal rolled up like a ball. As twilight comes on they begin to be more alert, springing lightly and actively about their cage, and from perch to perch, uttering a peculiar grunt of pleasure and satisfaction. At this time they seem most desirous of food; this, which in confinement is usually bread and various fruits, they take in their hands like a monkey, but with-

out raising themselves up or resting on the haunches. They are essentially climbing animals, and their activity is very great: they will traverse a tree with prodigious bounds, and pass from one to another with surprising rapidity. Although capable of twisting their tail round objects, and thereby evidently adding to their security while perched aloft, they do not use it as a fifth hand, or true organ of grasping, like the monkeys of America; and it is uniformly covered with long soft fur: it adds greatly to their elegance and the *tout ensemble* of their figure.

Notwithstanding the delicacy of their constitution, and the temperature of their native climate, they endure the changes of our atmosphere much better than the monkey race; and with warmth and cleanliness will live in health and comfort. Dirt and wet not only annoy them, but produce disease and death. When suffered to run about a room, (and it is a pity to confine them,) they are very amusing; it is then only that they display the native ease and sweeping grace of their leaps; and as they are perfectly gentle, and have no love of mischief to gratify, they may be allowed their liberty so far with safety. One of their favourite situations is the edge of the fender, on which they will rest, spreading out their hands before the fire, half closing the eyes, and luxuriating in the genial glow.

Their temper is placid; but it sometimes happens that two fellow prisoners cannot agree, and we have seen them pursue each other evidently with the intention of biting; indeed, they have been known to fight with fury. The noise which the Lemur makes when alarmed, or suddenly startled, is very singular; it is a

sort of braying, or roar of interrupted hoarse sounds ending abruptly.

As we have only seen these animals in a state of captivity, and know little of them in their native forests, we cannot speak with certainty as to their natural food: we believe it to be fruits, eggs, and small animals, as young birds and insects.

In their general size, although a little difference in this point exists among the species, the Lemurs equal a large cat; but their hinder limbs are much longer, and the body more tapering. The eyes are full, the pupils round, the irides bright hazel, more or less inclining to orange. In confinement blindness is a common occurrence. The species are numerous; and it would seem that in Madagascar the term Mongous is applied indiscriminately to all those whose colour is of a uniform brownish gray; and the name of Mococo to that species distinguished by the tail being ringed with alternate black and white. A common appellation to the whole race is that of Madagascar Cats.

In the menagerie of the Zoological Society, which contains a fine collection of these animals, may be noticed the Black-faced Lemur, (*L. nigrifrons;*) the Collared Lemur, (*L. collaris;*) the Ruffed Lemur, or Le Vari of French authors; and many others. In the Museum of that Society the reader may see a still more extensive collection of specimens of this interesting genus, some of extreme rarity, and one or two new to science. Among them may be distinguished the Red Lemur, (*L. ruber,*) a rare and beautiful species, which was sometime since living in the menagerie.

The RED LEMUR is one of the largest of the genus, but appears to bear our climate less easily than the others. Its fur is of a deep rich chestnut; the under parts and tail are however black, as are also the face and four hands. It is easily tamed, and is very gentle; but passive and indolent, sleeping during the day in a coiled posture, which, if disturbed from it for a short time, it soon reassumes. The Mococo, or Ring-tailed Lemur, is a much more lively animal; it is fond of being noticed, and is very playful. The uniform colour of the fur is a dark gray, becoming paler beneath; the tail, which is its characteristic ornament, is marked, as we have noticed, with alternate rings of black and white.

But the most striking and elegant of its race is the



RUFFED LEMUR, or Le Vari; of which we have given a faithful portrait.

This species exceeds the others in size, and its voice is louder and more hoarse; its fur is varied with pure white and black in nearly equal proportions, subject however to individual differences; but the four hands are always black; and a full white ruff or tuft surrounds the face. In its habits and disposition it is similar to its congeners.

Closing the series of quadrumanous animals are several genera which have been confounded by earlier writers with that of the true Lemurs; but from which they are now rightly separated, not only because they differ as it respects the countries they inhabit, but because they exhibit marked generic characteristics. They are nocturnal animals, pursuing their food, which consists of insects and small animals, solely during the night. Their eyes are extremely large and adapted to their habits. The day is passed in profound sleep, from which they rouse as the dusk comes on, to begin the search for their prey.

The genus termed **Loris**, *Geoff.*, or **Stenops**, *Ill.* (Στενος, *contracted*, and Ὤψ, *countenance*,) which is characterized by shortness of muzzle, want of tail, and roughness of tongue, includes, among a few other species, that very singular animal the **Lori**, or Slow Lemur, a native of Bengal, where it is called in Malay the "*Poucan.*" Of all animals the Lori is one of the most slow and indolent, creeping along with an air of difficulty and constraint. It seems, however, not altogether devoid of intelligence, and may be partially tamed.

D'Obsonville, who kept one in his possession, says, that "at the approach of night it would rub its eyes, then, looking attentively on all sides, would walk over the furniture, or rather over the cords which I had disposed for that purpose. Milk and very ripe fruits were not disagreeable to it; but its chief food consisted of insects or small birds. If it perceived any thing of this kind, which I used to amuse myself by placing at the extremity of the room, it would approach with a lengthened circumspect pace, like one who was groping his way in the dark. Arrived within about a foot of its prey, it would stop, then raising itself upright would advance in that posture, stretching out its arms gently, and would suddenly seize the object, which it instantly strangled." In size the slow Lori is equal to a lemur, being fifteen or sixteen inches in length; its fur is short, and of a yellowish gray, with a brown stripe along the back.

The GALLAGOS form another singular tribe of animals, and are peculiar to Africa. Their habits are nocturnal; their eyes large; and their food insects and birds. Their hinder limbs are very long; their tail long and tufted; and they jump with extreme agility. The ear is large, membranous, and naked; and its powers are highly acute. According to Adanson their manners are those of monkeys and squirrels, perching among the foliage of trees, where they pursue their insect food, which they take with the hand. They make their nests like squirrels in the branches of trees, and cover a bed of grass and leaves for their little ones. With the natives of Senegal they are an article

of food: they abound in the gum-tree forests of the deserts of Sahara, and are caught by the Moors, and brought to Europeans on the coast for sale. They are there called "the animals of the gum." When sleeping, the Galago closes its ears, by folding down the external membrane, but opens them on the slightest noise. It is a pretty, gentle animal; the length of the body is about seven inches, that of the tail nine.

We here close our sketch of this *order*, having traced it receding from the orang by successive steps, until those prominent features which marked it at its outset become softened down as it were in the distance. But in tracing it thus step by step we have only done half our work if we have forgotten Him whose mighty wisdom conceived the plan, and bade all spring into life out of nothing; all the harmonies of nature; all the accordances of being; and those endless grades which constitute a chain, returning as a circle into itself, and forming one great whole. "These are thy works, Parent of Good!" But these are not all. The plan of creation was followed (so to speak) by the plan of redemption, a plan in which God not only displays His wisdom and power, but His love. "In this was manifested the love of God toward us, because that God sent His only begotten Son into the world, that we might live through Him." 1 John, iv. 9. Reader, think on this God of power and love, and then on yourself. "What is man, that Thou art mindful of him? and the son of man, that Thou visitest him?"

ORDER III.—CARNIVORA.

Extremities four: neither in this nor in the succeeding orders is there a thumb free and antagonising with fingers, and consequently no true hands; teeth of three kinds.

THE Third Order of Mammalia, is that comprehending the CARNASSIERS, *(Carnivora,)* or animals whose appetite is more or less exclusively carnivorous.

The great tribes into which this *order* is divided differ considerably in their habits and manners, and present a group much less united by similitude, much less bound together by strongly marked features pervading every subdivision, than we have found obtaining among the previous *quadrumanous order*. Some, like the bird, are expressly formed for flight, while, on the contrary, others tenant the sea, and prey upon the finny tribes of the waters.

Although the circumstance of living upon the flesh of other animals is one of the chief peculiarities of this order, and one from which it derives its generic title, still this fact as an universal characteristic, must be taken to a certain degree in a limited sense only; for, in one family at least, we find the diet to consist in a great measure of vegetable substances, to which flesh is only added occasionally. The differences in habits and structure which occur in this order prevent the possibility of arranging the genera in a line perfectly unbroken and uniform, but rather conduce to their distribution into families branching out from a

common centre, and connected among themselves by various and multiform ties of relationship. We do not, however, mean to say by this observation that there are no grounds which the order can occupy as a common resting-place; on the contrary, its title is established, and its boundaries are fixed by natural limits, which it is impossible to mistake. In defining the characters of this order we may state, that the teeth are always of three kinds, namely, *incisores*, or *cutting teeth; caninæ*, or *canine teeth;* and *molares*, or *grinders*. The *incisores* are generally small and feeble, while the *molares* are modified in form according to the predominating quality of the food, and the *canine teeth* are strong, firm, and well developed. The jaws are restricted to a scissor-like motion, the articulation being on the principle of a simple hinge, and not admitting of that grinding movement from side to side which we see in animals purely herbivorous.

Of the senses that of *smell* is the most acute, the organization for this purpose being peculiarly developed, a circumstance the reason of which is very evident, as many follow their prey by this faculty.

The power of turning the fore-arm, although with less facility, is continued from the previous order; but there is no thumb, (a member from which so much advantage accrues,) and the feet, although divided, have little resemblance to those of the quadrumana. In the more typical order their construction is preeminently adapted for lacerating, while the fore-arm enjoys an according degree of liberty.

Among the most singular of this order, and placed at its head, is a family called *Cheiroptera* (χειρ, *a hand,*

and πτερον, *a wing)*, from a thin membranous expansion, which, extending down on each side, encloses the extremities, and, serving the office of wings, affords the power of flight. Our readers will easily perceive that we allude to the BATS, a numerous tribe, consisting of many genera differing from each other in various particulars, but into the minutiæ of which it is foreign to our design to enter. As generic characters, besides the possession of wings, we may add, that in each jaw there are two canine teeth, large and sharp, the incisores varying not only in number but in relative proximity together, a circumstance which, connected with concomitant peculiarities, is one of the grounds of subsequent division.

The Bats then are distinguished by membranous wings stretched over the limbs, of which the anterior as well as the fingers, excessively lengthened serve the same office as the whalebone of a parasol or umbrella. These wings present an extent of surface much greater in proportion than what obtains in birds, and, as the muscular powers for moving this apparatus are in due accordance, the flight of the animal is strong, rapid, and marked by sudden evolutions and turns, executed with astonishing celerity. The thumb, however, or rather that which we may so denominate, instead of being long and attenuated like the fingers, or enclosed in the membrane, is free, short, and armed with a strong hooked claw, by which the animal manages to crawl along the ground. The hind feet are feeble, divided into five toes, furnished with sharp-edged and pointed claws: the eyes are extremely small; but the external ears, which are membranous, are often large,

and form, in conjunction with the wings, an extensive surface nearly naked, and endued with the most singular and exquisite degree of sensibility. This sensibility is, indeed, of such a nature as to endow the Bat with something like a new sense, which goes far to serve it in lieu of sight. From the appreciation by this faculty of the modified impressions which the air produces, in consequence either of its currents and their strength and direction, or its quiescence, or its temperature, or all conjoined, the Bat is capable of directing its course through the most intricate mazes, and in profound darkness, nay, even when deprived of sight altogether. Various experiments have at different times been tried in order to ascertain how far and under what circumstances this peculiar faculty or sense is called into operation; and it has been found that, though the eyes be sealed up or even removed entirely, and the animal let loose in a room with a thousand intricacies and objects, it will pursue its abruptly-wheeling flight as usual, threading every labyrinth, avoiding every obstacle, nor yet striking against the walls, and all this with the same ease, quickness, and precision, as would have been the case had the sight been ever so perfect. Of the many species inhabiting our climate, one or two, it has been suspected, are migratory; all are exquisitely susceptible of cold, and, in the northern parts of Europe at least, pass the winter in a state of lethargy, retiring as autumn gives token of a decrease of temperature to their lurking places in old ruins and hollow trees, till the spring recalls them to activity. The Bat is a twilight rambler, remaining concealed during the day, but making its appearance

as the dusk of evening advances, when it begins its flight in pursuit of moths and other insects, skimming the water like a swallow, darting through the sombre foliage of the trees, or wheeling round the barn, repeatedly uttering its sharp shrill cry of exultation or delight.

During the fine calm evenings of summer, the activity of this little animal seems wound up to its highest pitch; then occupied by the ardour of the chase and heedless of every thing else, the mousing owl or insidious net too often prove its destruction.

The majority of Bats live, as we have intimated, on insects; the intestinal canal is short and of nearly equal diameter throughout; the incisores are lobular, the molar teeth bristling with points. Some confined to the hotter portions of the globe exhibit a fondness for blood, whence many wild and singular fables have arisen; but in others, on the contrary, as the Roussettes *(Pteropus)* the diet is chiefly fruit, while the teeth manifest a corresponding departure from that modification which may be deemed characteristic or typical of the family, the incisor teeth being sharp-edged, and the molares having a flattened surface crossed by two longitudinal bands, which are raised by an intermediate groove.

Before proceeding to several interesting particulars respecting the Bats of our own country, and those far more extraordinary in size and habits which infest regions beneath a tropical sun, we would introduce the subject by remarking that the Bat, in general terms, is among the animals mentioned in the holy scriptures. The first notice we have of this singular

creature is in Lev. xi. 19, and again in Deut. xiv. 18, where we find it among the articles prohibited from use as food. Subsequently we find a graphic allusion to its habits in Isaiah ii. 18—20: "And the idols he shall utterly abolish: and they shall go into *holes of the rocks*, and into the *caves of the earth*, for fear of the Lord, and for the glory of His majesty, when He ariseth to shake terribly the earth. In that day a man shall cast his idols of silver, and his idols of gold which they made each one for himself to worship, to the moles and to the *Bats*."

When the inspired writers of the sacred volume avail themselves of the objects of nature, either in illustration of their subject, or in connexion with it, we cannot fail to be struck, however casual or slight the allusion may be, with a philosophic correctness, which is hardly overstepped even when that allusion is clothed in the elevated diction of poesy.

The Bat was well known throughout Syria; and the crevices, the lonely caverns, and sepulchres in the rocks around Jerusalem furnished in the days of old, as in the present, a secluded hiding-place. One idea, therefore, which the inspired writer designed to convey was that of *neglect* and *loneliness:* their idols should be consigned to oblivion, their temples to ruin; man should forsake them, and the seclusion-loving Bat should make the halls, once thronged with idolatrous worshippers, its solitary abode; or the idols should be cast out of every house and temple, and thrown among the caves and desolate places of the rocks, where even their memory should be lost. Another idea was that of *disgust* or *contempt*. The Bat by the Jewish laws

was accounted unclean, and consequently held in abhorrence: it was unfit for food; it was no welcome guest in Judea: to consign the idols to the Bats, therefore, implied *aversion, degradation,* and *reproach.* Hence we see that the prophet used no random expression, but the most striking and appropriate which he could possibly have selected, and one the force of which a Jew would have felt in its fullest meaning.

The Jewish dispensation, fettered with ceremonies and observances heavy to be borne, and to a certain extent impossible for us to reason upon, has been happily abrogated by a better dispensation promulgated by the blessed Messiah, whose "yoke is easy," and whose "burden is light." To us, therefore, the Bat is no foul thing of darkness, but an interesting little animal, associated with recollections of summer-eve, and peace, and quiet hours of contemplation. Who cannot retrace, who does not love to retrace the walk by "woods, and lawns, and living stream at eve," when the toils of the day and the hurry of business are over? At such a time, while all around breathes of the beneficence of the Great Creator, and the calm repose of the hour blending with the rural harmony of the scene has awakened trains of thought absorbing every feeling of the soul, how often has this little plunderer, uttering its shrill scream as it has wheeled rapidly round our head, broken in upon our musings, and interrupted our train of reflection? and yet it is a favourite. The old trees, the river, the antique farm-house, the cool, sequestered lane require its presence at the twilight hour to make the charm complete.

It is but within a few years that naturalists have paid much attention to this singular family, and consequently the number of species correctly made out has been but very limited. Fifteen or sixteen different species indigenous in Great Britain are now, however, known; these are referable to three different genera, namely, *Rhinolophus*, distinguished by leaf-like membranes on the nose; *Vespertilio*, of which our common Bat is the example; and *Plecotus*, embracing such as have large expanded ears. In general habits and manners they all agree, nor are we aware that they differ much as to the periods of hybernation and activity. In that delightful book, White's "Natural History of Selborne," we find the following sketch, which we take the liberty of presenting to our readers. He says, "I was much entertained last summer with a tame Bat, which would take flies out of a person's hand. If you gave it any thing to eat, it brought its wings round before the mouth, hovering and hiding its head in the manner of birds of prey when they feed. The adroitness it showed in shearing off the wings of the flies, which were always rejected, was worthy of observation, and pleased me much. Insects seemed to be most acceptable, though it did not refuse raw flesh when offered; so that the notion that Bats go down chimneys and gnaw the bacon seems no improbable story. While I amused myself with this wonderful quadruped, I saw it several times confute the vulgar opinion, that Bats when down on a flat surface cannot get on the wing again, by rising with great ease from the floor. It ran, I observed, with

more ease than I was aware of, but in a most ridiculous and grotesque manner. Bats drink on the wing, like swallows, by sipping the surface as they play over pools and streams. They love to frequent waters not only for the sake of drinking, but on account of insects which are found over them in the greatest plenty. As I was going some years ago, pretty late, in a boat from Richmond to Sunbury, on a warm summer's evening, I think I saw myriads of Bats between the two places; the air swarmed with them all along the Thames, so that hundreds were in sight at a time."

To persons accustomed only to our British Bats, the size of some of the foreign species must appear a little startling. Among the *Roussettes*, or fruit-eating Bats, *(Pteropus,)* all distinguishable for their great extent of wing, we may notice a species described by Dr. Horsfield as the Kalong, *(Pteropus Javanicus,)* which that eminent naturalist considers as the largest of the genus hitherto discovered. "In adult subjects the extent of the expanded wings is full five feet, and the length of the body one foot."

The Kalong is extremely abundant in the lower parts of Java, but does not visit the elevated districts. Numerous individuals, often in companies to the amount of several hundreds, fix upon a tree for their roosting-place, where suspended in rows and clusters by their hinder claws, with their heads hanging downwards, and their wings folded round them, they exhibit a singular spectacle. A species of *ficus*, often

growing near the villages, is a very favourite retreat.



During the day they are in general silent, but if disturbed, they utter "sharp piercing shrieks;" and their awkward endeavours to secure a shade from the oppression of the light are extremely ludicrous. If suddenly killed while thus suspended, they remain in that position after death. Soon after sunset they leave their roosting-place and begin their nightly search for food. All kinds of fruit, from the "abundant and useful cocoa-nut, which surrounds every dwelling of the meanest peasant, to the rare and most delicate productions which are cultivated with care by princes and chiefs of distinction," they indiscriminately attack and devour.

The flight of the Kalong, unlike that of our bats, so characterised by abrupt and sudden turns, is slow and

steady, pursued in a straight line, and capable of long continuance. The shooting of this animal during the fine moonlight nights, which in Java are uncommonly serene, is not only practised as an amusement, but as a means of preventing its ravages.

Superstition magnifies trifles. We are all aware of the terror associated with the name of the Vampire; the rapacity for blood which many species exhibit has not only been heightened by fear, but has proved the foundation of many wild and marvellous tales, coloured by romance, and propagated by credulity. Stripped, however, of the exaggeration of fiction, observers have agreed in attributing to several species of the *Phyllostoma*, as well as to the Vampire, (the sole species of the genus *Vampirus,)* an appetite for blood, and the faculty of sucking it from the veins of men and animals. These two genera are exclusively South American; we believe, however, that to some of the larger species of the older continents the same propensities have been attributed. Respecting the blood-sucking bats of America, Pison has given some very circumstantial details; and similar accounts are to be found in the writings of many authors. In the Natural History of Paraguay, by Don Felix d'Azzara, an observer distinguished for accuracy and discrimination, we are presented with a confirmation of the testimony of other authors. "The species with a leaf upon the nose," says this intelligent writer, "differ from the other bats, in being able to run when on the ground nearly as fast as a rat, and in their fondness for sucking the blood of animals. Sometimes they will bite the crests and beards of fowls while asleep, and suck the blood.

The fowls generally die of this, as a gangrene is engendered in the wounds. They bite also horses, mules, asses, and horned cattle, usually on the buttocks, shoulders, or neck, as they are better enabled to arrive at those parts from the facilities afforded them by the mane or tail. Nor is man himself secure from their attacks: on this point, indeed, I am enabled to give a very faithful testimony, since I have had the ends of my toes bitten by them four times while I was sleeping in the cottages in the open country. The wounds which they inflicted, without my feeling them at the time, were circular and rather elliptical; their diameter was trifling, and their depth so superficial as scarcely to penetrate the cutis. It was easy also on examination to perceive that these wounds were made by suction, and not by puncture as might be supposed. The blood that is drawn in cases of this description does not come from the veins or from the arteries, because the wound does not extend so far, but from the capillary vessels of the skin, extracted thence without doubt by these bats by the action of sucking or licking."

Upon examination, however, it would appear that the punctures are made with the tongue, and, as it regards man at least, are far from being attended with any formidable consequences; nor do the bats, as the story goes, fan the victim with their wings, so as to lull him into a profound sleep (while banquetting at his expense) from which he never awakes. On the contrary D'Azzara positively asserts, "that no one in our neighbourhood fears these animals, nor gives himself any trouble about them."

To give our readers some idea of the number of

distinct species, inhabitants of different countries, which this family comprehends, we may state that the well defined genera, given in M. Lesson's "Manuel de Mammalogie," amount to thirty-three; to which many others have been recently added; so that the number of species may be roughly estimated at more than two hundred.

Having spoken thus generally of the *Cheiroptera*, or family of Bats, a family throughout which there prevails a marked uniformity, notwithstanding those differences on which minor divisions are instituted, we shall proceed to introduce the next family to the notice of our readers. It is termed *Insectivora*, or the Insectivorous Family, because it comprehends those animals whose food is especially insects, or at least those whose dentition indicates that such form their principal diet, although not perhaps exclusively; since smaller animals and sometimes even vegetable substances must be likewise added.

Strictly speaking, the Bats, as we have seen, are insectivorous; but, as they possess striking peculiarities of structure, outweighing this characteristic, they form with propriety a separate family; like them, however, the *Insectivora*, " par excellence," have their molar teeth bristling with conical points, are most commonly nocturnal in their habits, and in colder climates pass the winter in a state of lethargy. Their limbs are short, their motions feeble, and in walking their entire sole is applied to the ground. Some lead a life entirely subterraneous.

One of the most familiar examples of this family is

that cruelly treated animal the COMMON HEDGEHOG, (*Erinaceus Europæus.*)



This well known animal frequents woods, copses, and thick tangled hedge-rows, where, closely concealed in some crevice between the mossgrown roots of a tree, among a mass of withered leaves, or in a hole it has excavated, it remains rolled up like a ball during the day, presenting a surface of bristling spines, which constitute an apparatus of defence, should its retreat be discovered. As the dusk of evening comes on, the Hedgehog issues from its lurking-place, and prowls about for food. Often while walking at night-fall among the woods near Bakewell, where these animals abound, has the author watched them tripping along the narrow paths and among the long grass with a noiseless step, and ears attentive to the slightest sound: if pursued, they make no attempt to escape by flight,

but instantly roll themselves up, and trust to their panoply of spines for safety; when the danger is over, they cautiously unfold, listen attentively, and, if all seems safe, continue their ramble. This faculty of assuming the figure of a ball of spines is the only means of self-preservation bestowed by the Author of Nature on this little animal: weak and timid, it has only this panoply in which to trust; but it may be said to be strong in its weakness, since this passive mode of defence renders it nearly impregnable to the attacks of its enemies.

The feet of the Hedgehog are plantigrade, and furnished with five toes, armed with very long nails, adapted to the purpose of digging; the ear is rounded; the eye small; the two middle incisor teeth are long and cylindrical, and between those in the upper jaw some distance intervenes, while in the lower they are close together; the true molares are furnished with four pointed tubercles, except in the first, where there are only three. Its food is insects, snails, frogs, fruit, together with succulent roots, for which it burrows with the nose. It is useful in gardens, and often kept at large in kitchens for the destruction of beetles. Pallas has remarked, as a singular fact, that it will eat hundreds of the blistering fly with impunity, while in other animals a single one is the cause of excruciating torments and death. In the second volume of the Zoological Journal, we have a curious relation of an encounter between a Hedgehog and a snake, from which we are led to conclude that snakes not unfrequently furnish a meal to these carnivorous little quadrupeds.

The Hedgehog was, and we believe is regarded in some countries by the ignorant with aversion, who allege, as an excuse for their cruelty towards it, that it is guilty of draining the milk and poisoning the udders of the cows while sleeping in their pasture, an opinion too absurd to be worth the trouble of refuting. This animal is an inhabitant of the whole of Europe, excepting the colder regions of the north; and even in the warmest countries passes the winter in a state of lethargy, covered with leaves and moss. India, Egypt, Turkey, and Africa, present other species, making up a group of about six; and their habits, as far as known, resemble those of the European species.

Differing from the hedgehog in many essential points, but possessed like it of a spiny coat of mail, and the faculty of rolling up, though not into so complete a ball, are three animals peculiar to Madagascar, which form the genus *Centenes:* two of these were known to Linnæus, and placed by him in the genus *Erinaceus,* from which they are now rightly separated. These animals are the TENREC, (*Centenes acaudatus;*) the TENDRAC, (*C. setosus;*) and the varied TENREC, (*C. semispinosus,*) which last is scarcely larger than a mole. The first has been naturalized in the Isle of France. All we know of them is, that they are nocturnal, and, although in the torrid zone, pass three months of the year in lethargy. In each jaw there are four or six incisores and two large canine, behind which are placed one or two little teeth, and four triangular and pointed molares. They have no tail, and the muzzle is very pointed.

The next genus of the *Insectivorous Family* which we shall notice is that of the SHREWS, *(Sorex.)* The Shrews form a numerous group, confined to the older continents, and almost entirely of recent discovery. The sole species which was formerly known to naturalists, before strict accuracy characterized scientific studies, was confounded with the *mice*, a genus belonging to quite a different order, namely, *Rodentia*; and Pliny notices it under the name of *Mus araneus*, from which its present French name, *musaraigne*, is derived. On Pliny's authority it was long retained among the mice, till Daubenton, in 1756, added another to the list and confirmed the propriety of the genus *Sorex*, which had then been recently established.

The Shrews are yet accounted as *kinds of mice* by persons in general; they have, however, no immediate relation to these animals; and if any of our intelligent readers will take the trouble to examine and compare their teeth together, he will immediately be satisfied upon the subject. The two middle incisor teeth above are crooked and indented at their base; those of the lower jaw prolonged and inclining; five little teeth in the upper jaw succeed; two only in the lower; and after these, in each, three pointed molares; to which, in the upper jaw, a little tubercular molar is added, which terminates the series.

These little animals are easily distinguishable from mice by the conical form of the head also, and the attenuated nose tapering to a long projecting point. They place the entire sole of the foot on the ground, a circumstance which gives the legs the appearance of shortness; the ears are rounded; along the sides of

the body are small glands secreting a humour of a peculiar and unpleasant odour. In England there are three species; the one the well known common Shrew, (*Sorex araneus,*) which frequents meadows and sunny banks, where its shrill piercing cry may be often heard in spring and summer. In August numbers of these animals are found dead by the sides of banks and along the pathways, without any known cause to account for this extensive mortality.

The two others are called *Water Shrews*, and frequent the banks of rivers, ponds, and marshes. The larger species is the *Sorex fodiens*, of which we have the following notice in No. 23 of Loudon's Magazine, for 1832:—"This curious little animal is not often seen except by those acquainted with its habits; it resembles the common Shrew, but is twice the size; the upper part of the body black; beneath, dirty white; the fur like that of a mole. Water Shrews live in the banks of rivulets and spring-water ditches, and appear to collect their food, which probably consists of the larvæ of the ephemeral flies, from among the loose mud. If cautiously watched, they being naturally shy, they may be seen crouching at the mouths of their holes looking intently into the water. Should a shoal of minnows or sticklebacks pass near, the Shrew plunges amongst them, but seldom succeeds in making a capture; and, retiring to his station, looks out for another chance. They dive with much adroitness, and can remain under water for the space of a minute. Their fur repels the water from their bodies, as while they are submerged, they appear to be almost white.

When pursued by the weasel, they drop into the water and pass to the opposite side."

The other species is very similar in habits and manners to the preceding, and must be considered as a recent addition to our *Fauna.*

To the genus *Sorex* succeeds one termed *Mygale,* which includes the Desmans, allied in habits to the water shrews, but distinguished by a tail, scaly and flattened at the sides. One species, called the RUSSIAN MUSK RAT, from its odour, is common along the lakes and rivers of the southern portion of that empire. Another small species is found along the streams of the Pyrennees. Canada produces the SCALOPE, (the type of the genus *Scalops,)* to which Linnæus gave the name of *Sorex aquaticus;* but which is now divided from the true shrews.

As our plan is only to prepare the young reader for entering upon a truly scientific mode of studying this delightful science, we shall be excused for our discursive mode of proceeding. We cannot, however, before leaving the *insectivora,* omit a genus containing an animal whose interesting habits and manners claim our peculiar notice. We allude to the COMMON MOLE, *(Talpa Europæa.)*

The Mole (if not the sole, at least the typical species of the genus *Talpa,*) is confined to the western portions of Europe, where it is extensively spread, with a few singular exceptions. The ancient Greeks do not appear to have been acquainted with it. Aristotle,

in his description of the Mole found in Greece, and which he calls Spalax (Σπαλαξ,) expressly asserts its *total deficiency* with respect to the organs of vision. Now, as the organs of vision, although small, buried in the fur, and rudimentary, still exist in the Mole, (notwithstanding many persons in the present day believe it to be altogether destitute of them,) this great observer of nature has been accused of a gross mistake, which superficial observation would at once have corrected. The spalax, however, is not the Mole, which, if it ever occurs in Greece, is extremely uncommon; but a little subterraneous quadruped, somewhat resembling the Mole in its habits, belonging to the *order* Rodentia, and known to modern naturalists under the name of the *mole-rat*, an animal which, indeed, by its blindness, exonerates Aristotle from the charge of ignorance: no external eye is visible; but beneath the skin there is to be found a little black grain, a rudiment as it were of this organ, which must be quite useless as it regards vision, since the skin passes over it without even becoming thinner, or being in the least degree deficient of fur. That modern discoveries should prove the truth and accuracy of an ancient writer, after much discredit, is a circumstance well deserving record in the archives of science; and an important lesson may be gleaned from it, which to the young is especially valuable; namely, how needful it is to suspend their judgment, and instead of giving a hasty or rash opinion without the thorough knowledge of a subject, to defer until after mature investigation, and even then to remember the injunction, "Be not over wise in your own conceit." How ready are we to

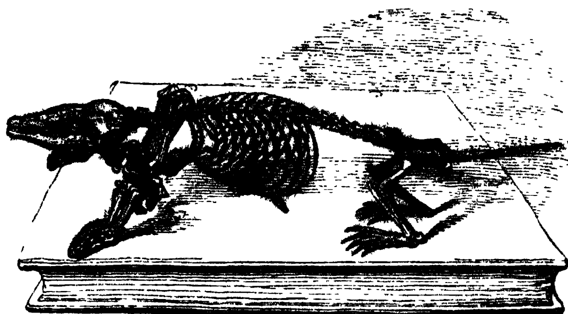
consider the views and opinions of others erroneous, and even perhaps treat them with contempt, thereby, in reality, convicting ourselves of ignorance and presumption! "Truly, this man was the Son of God," was extorted from the incredulous soldiers at the crucifixion of our blessed Redeemer; and thus in our days the men of the world, the careless and the thoughtless, who are dreaming life away, are too apt to consider religion a superstition, and without investigating the subject, deem those who profess it, those who are striving for the truth as it is in Christ Jesus, mere enthusiasts, to be pitied for their errors, or despised for their folly; while they themselves are in the darkness of ignorance, and dead to that knowledge which would open new scenes, unfold new hopes, and make them wise unto salvation. Such a man called out of darkness into light, convicted of his former errors will say, "Whereas I was once blind, now I see."

Although the term Mole occurs in the scriptures, its reference to the present animal is more than doubtful, the Mole not being a native of Syria, and the original word also being variously translated.

While most Mammalia enjoy the light of day, and the freedom of earth's varied surface, revelling in air and sunshine, this little miner passes his days and partakes of all the enjoyments of existence in darkness and confinement. His happiness and his home are limited to the subterraneous galleries, which he excavates with admirable skill and industry. For his appointed lot the providence of his Maker has expressly framed him, and we can hardly bring forward a more beautiful example of *means*, exhibited in the minutiæ

of animal structure, proclaiming the *end* to be obtained, than is presented by this little creature. The Mole is *essentially* a miner: the fore feet, which are broad and muscular, are constructed like hands, with an oblique direction, so as to make the inner edge the lowest part, thereby forming more complete paddles for throwing the soil behind it; the fingers, scarcely divided, are five in number, and armed with strong flat nails; the arm is short, its muscles and those of the shoulders being very powerful; the hinder limbs are small; the body is round, cylindrical, and compact; the snout prolonged and pointed; the fur soft, close, and velvety. The sense of hearing is very delicate, although there is no external conch to the ears, and the auditory opening concealed by the fur is small; a valve capable of being raised or lowered like an eyelid, the mechanism of which is evident if the fur be shaved away, closes this aperture at the will of the animal, so as to exclude any particles of earth or sand. The eye is exceedingly small, and buried in the fur for protection, but may be uncovered at pleasure, so as to be brought into use when needed during its occasional visits to the light of "our world." The power of vision is, however, of the most limited degree, for though the optic nerve be present, as Cuvier believes, still as no faculty is bestowed uselessly, that of vision would not be given in high perfection to a creature which never needs it: in fact, in the Mole this organ is in its lowest stage of developement. It is by its keen sense of smell that the Mole is chiefly directed in its search for food; feeding under ground and in darkness, upon this faculty depends its daily

existence, it is therefore developed to a remarkable degree of perfection.



The skeleton of this animal, of which for obvious reasons we have chosen to give an accurate drawing rather than of the animal itself, is very peculiar, and justifies our observation, as it regards the adaptation of form and structure, as well as of the senses, to the allotted mode of life.

The skeleton of every animal, we hardly need observe, being the basis of its organization, is also the index of its habits; and in no instance is this accordance more displayed than in the present. If, then, we look at the skeleton of the Mole, we shall find its great developement manifested in its *anterior portion,* the pelvis and inferior extremities being small and reduced; in fact, the muscular powers, and the framework for supporting those powers, are thrown as far forward as possible, so as to concentrate the whole force and energy in the anterior portion. The chest, strongly

environed with bone and muscle, is large and capacious, enclosing the vital organs; namely, the heart and lungs, which are of great comparative volume, indicating by their developement the energy of the muscular system. From the sternum, or breast-bone, an additional bone proceeds forwards, having a deep keel like that of a bird for the extensive attachment of the enormous pectoral muscles. The clavicles are thick and short, and the humerus angular, and as broad as it is long, while the scapula on each side is long and narrow. Now, by this construction of the sternum, the shoulders are consequently thrown far forward, and for a most important object, namely, in order that the volume of those muscles may be increased, the constant and powerful action of which the animal's instincts and mode of life require. The space between the humerus and the ribs, then, is filled up by the immense pectoral muscles; and in consequence of the distance between the short humerus, into the lower part of which they are inserted, and the ribs and sternum, whence they take their origin, not only is their volume greater, but their action different from what is seen in other mammalia. The course of their fibres is such as to lead them not to bring the arms closer to or across the chest, but to draw them downwards and somewhat outwards, the action employed in digging. Mass of muscle gives strength; length, velocity of motion: Now, the muscles for raising the arm at each stroke do not so much require strength as celerity, that no time be lost between each stroke; now for this very purpose are the clavicles elongated, that the muscles

for raising the arm may have this requisite figure. The bones of the fore-arm are very strong, and the olecranon of the ulna is large and transverse, for the insertion of immense extensive muscles which act in conjunction with the pectoral. The hands are large, broad, and thick, the bones being knit firmly and solidly together; the claws are enormous: these are the organs by which it throws up the earth. But the head is also an organ for digging or boring; it is flattened and elongated, and the cutilages of the nose are ossified, so as to form an additional bone; thus constituted as a borer, to make it still more effective, the ligament of the neck, *(ligamentum nuchæ,)* which passes down the spinous processes of the vertebræ, and is in other animals elastic, is here bone also, that the power of raising up the head and pushing with the snout may be increased, and the strain upon the neck better borne. Through whatever aperture the anterior parts pass, the hinder must necessarily follow. The pelvis is very small, and, excepting from situation, does not merit the name, as the organs usually contained in it here pass anterior to its pubic portion. The bones of the hind limbs are small and slender, and the feet, though furnished with claws, are feeble in comparison with the spadelike hands. The hinder parts, therefore, offer no impediment to the creature's progress along its narrow galleries, but yet have the requisite degree of strength, so as on the other hand not to be themselves in the way. In short, were we called upon to prove the design and attentive care of God, carried through his works, we would go into the

fields, and point out the habits and manners of this little animal, and the fitness and express adaptation of the means with which it is provided.

If the Mole ever voluntarily emerges from its subterranean asylum, it is only for the purpose of seeking a more favourable soil, in which to construct its halls and winding galleries. Rich and cultivated meadows, abounding in worms and other insects, are the localities of its choice, where it sinks the shafts of its mines, as winter sets in, below the line to which the frost penetrates. But, although in this season less active than in summer, it does not become torpid as the dormouse or marmot. The twilight hours of morning and evening are its periods of labour; and as spring approaches, softening the earth with showers, and calling the snowdrop and crocus from their winter sleep, the fresh-thrown hillocks of this "*goodman delver*" dot the green surface of the fields, and often so thickly as to convert the level champaign into a mimic representation of mountain scenery, where "Apennine and Pyrennees branch out stupendous into distant lands."

The galleries of the Mole have numerous inter-communications; but its nest, where the female nurses her helpless young, is formed in a vault, constructed with great care, the centre of many diverging passages, and made soft with leaves, grass, and the scales of bulbous roots. The parents afford a pattern of mutual affection and assistance.

The food of this animal consists of worms, insects, and, when it can obtain them, small birds or quadrupeds, to which roots are also added: it is impatient of hunger, and cannot endure a fast of more than six

hours without great exhaustion; an abstinence of twelve hours is said to produce death. Agriculturalists are divided in opinion as to the benefit or injury which the Mole occasions; certain it is that it has its uses and its appointed work in the grand scheme of which it forms a part.

We have often in our boyish days, as we have contemplated the poor Mole trapped and suspended in the air, felt compassion that so beautiful a creature, quietly pursuing its course under ground, should be suddenly seized and thus sentenced to execution.



Passing from the *Insectivora*, the third family of Carnassiers presents itself. As the molar teeth are those by which the food and disposition of animals is most decidedly characterized, we here find them, as might be expected, exhibiting an according modification. They are of three sorts: 1. One or more small

pointed teeth on each side, called "*false molars;*" 2. These are followed by a tooth of large size and great strength, with elevated conical points, having sharp cutting edges for lacerating and dividing flesh; this tooth the French emphatically call "*carnassiere,*" others "*laniary molar;*" 3. Behind this, one or two teeth varying in size, with flat or tuberculated surfaces, forming the back teeth; these are called the "*tuberculous molars,*" and are larger and more developed as the animal partakes the more of a vegetable regimen. The edges of the *laniary teeth* do not come in contact, but pass by each other like the blades of a pair of scissors. The present assemblage of animals is essentially ferocious and sanguinary, maintaining a warfare of destruction more or less unremitting upon their fellow-brutes, and gifted many of them with bodily powers which render them not only the terror of the forest, but formidable to man himself. Some, however, it is true, except when pressed by hunger, subsist almost entirely upon vegetable diet; and, as we have intimated, the proportion which obtains between the tuberculous surface and cutting edges of the molar teeth will give a standard by which to calculate the prevailing nature of the regimen: for the more completely thrown up into conical points with cutting edges the grinding teeth may be, and deficient in blunt tubercles studded along their surface, the more exclusively carnivorous is the appetite, and bloodthirsty the disposition; such are the true *Carnivora,* the larger species of which are thinly scattered, and driven more or less entirely from the haunts of civilized man. The necessity of maintaining personal security by warring

against these scourges of their kind, in the earlier ages of men, when "the world was all before them where to choose," cannot be questioned; and well would it have been for the human race had that propensity for destruction, which stains our fallen nature, been limited in its exercise to the "lion and bear;" but, alas, as the earliest records of history prove, man, after subduing the forest to himself, and sprinkling the plains and hills with leaf-thatched huts, (the first faint dawnings of arts, agriculture, and commerce,) has turned his hunting-spear upon his fellow, severed the bonds of brotherhood, and perpetuated causeless wars from generation to generation.

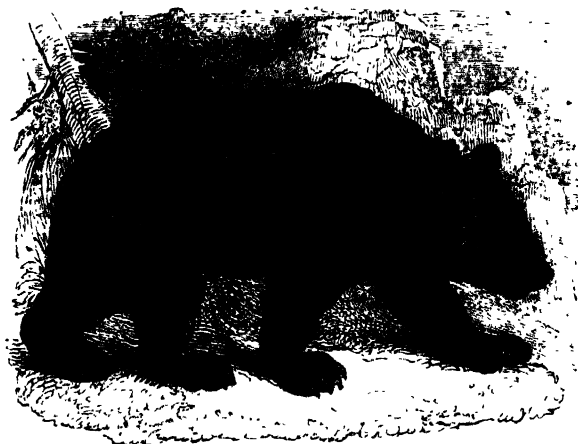
There is something in the human heart in its present fallen state fearfully akin to the nature of the ferocious brute of the wilderness. The brute follows its instinct; but what has man to plead,—man, whose reason entails upon him a moral responsibility for every action? What can he offer in extenuation of the desolations he has spread over the earth? The pages of history are stained with blood; they portray man in colours of the deepest dye, and few and far between are those softer touches which ameliorate the harshness of the picture, and on which we would pause to gaze, were it but to relieve us from the surrounding scenery of woe. And oh! how lovely, how beautiful, how doubly beautiful appears the character of the peaceful contemplative philosopher, the sage of olden times, the man of God, the christian whose warfare is spiritual, contrasted with those heroes, so falsely called, who, in the gratification of mad ambition, have left their track through lands once happy and flourish-

ing, reeking with the blood of slaughter, and their name written in gory characters, a watchword to succeeding generations; who, in the applause bestowed on courage and success, forget the ruin of cities blotted out for ever, or marked only by the "blackness of ashes;" forget the tears of widows and the cries of orphans, and, impelled as it were by the tiger-spirit "of the first-born Cain," echo praises to their warrior-idols, inscribe their titles in the temples, and burn to imitate their example. Of these fearful propensities, and the atrocities to which they lead, the reader will find many horrid instances in the Polynesian Researches, which painfully show that, amidst the most lovely scenes of nature, "man is vile," till the light of the gospel has shone around him, and the mild spirit of a merciful Saviour has succeeded to his sanguinary habits.

To return to the Carnivora. The first section we find to be that of the *Plantigrades*, so called from their applying the entire sole to the ground, so as to have the free power of raising themselves on their hinder limbs or haunches, and maintaining with ease an upright position. There is a slowness and heaviness in their motions; their habits are generally nocturnal, and in the northern regions they usually pass the winter in lethargy. The *Bears* usher in the section, and may be considered as forming the connecting link between this family and those of the herbivorous mammalia; their claws are strong, blunt, and well adapted for climbing or digging, but not for lacerating; their

molar teeth are obtuse, their tongues smooth, and their general contour thick and clumsy.

The BROWN BEAR, *(Ursus arctos,)* formerly common



in England, as well as over the whole of the European continent, is now confined to its more inaccessible and thinly inhabited regions, where rocks, glens, and forests, still afford him a precarious safety. Norway, Sweden, Russia, and Poland, are the countries in which he is still plentiful; among the Alps also, the thinly scattered remnants of his race, once numerous there, still linger. In the dense and gloomy forests of Scandinavia the Bear attains an enormous size. Mr. Lloyd states, in his "Field Sports of the North," that he has killed one of the weight of four hundred

and sixty pounds; but they have been known occasionally to exceed seven hundred. The diet of the Bear consists of roots, leaves, succulent plants, and various wild berries, with corn, honey, and ants, of which he is very fond.

Although often discovered taking up his quarters in the proximity of flocks and herds, he by no means generally proves so destructive a neighbour as might be expected: and Mr. Falk affirms, that Bears may reside for years in the neighbourhood of cattle without doing them any injury; though he adds, that "they will sometimes visit herds solely from the desire of prey;" and instances have been known of their climbing the roofs of cowhouses, which they have torn off in order to gain admittance to the poor animals confined within; these, after the slaughter, they have managed to carry away by shoving or lifting through the aperture by which they themselves had entered. Their strength is indeed astonishingly great, as the fact attested by Mr. Nilsson proves, who asserts, that "a Bear has been seen walking on his hinder feet along a small tree that stretched across a river bearing a dead horse in his fore paws." Hunting the Bear is a favourite amusement in the north, though by no means unattended with danger. In Sweden it is usual for the hunters to form a ring, or *cordon*, surrounding a certain extent of country. The number of men engaged is often fifteen hundred, and the circumference of the space enclosed sixty miles. The circle is then gradually contracted, escape being permitted for other animals, by which means the Bears are driven into a narrower and narrower compass, till the slaughter

commences. The Bear is also hunted by dogs, the men being armed with spears and rifles. Numbers are also taken in traps. The flesh is much esteemed as food, and the hams and paws are great delicacies.

The Bear swims well and fast, and is fond of bathing in the heats of summer; his climbing powers are well known; all who have visited the Gardens of the Zoological Society have witnessed the feat of mounting the pole for the tempting morsel proffered as a reward. In descending a tree or precipice he always comes down backwards, much resembling a human being in his actions and cautious mode of proceeding. The habits of this animal are unsocial and solitary: he lives alone, and chooses his retreat in the deepest gloom or most inaccessible parts of the woods or rocks; here, during the severity of a northern winter, in some cleft, or cave, or hollow tree, or, where these fail, in a moss-lined hut, constructed by himself of branches and leaves, he slumbers away the days in a state of almost lethargy, without food, and supported by the absorption of fat accumulated during the summer. When spring returns, lean, gaunt, and famished, he issues from his den, and, ravenous for food, is then especially to be dreaded.

America presents us with several species of Bear: the Black, *(Ursus Americanus;)* the Cinnamon, most probably a variety; and the Grizzly, *(Ursus ferox.)*

The Black Bear is smaller than the European species, lighter in its make, and with shorter and more glossy fur, which is much sought after as an article of

commerce. In the year 1783 we learn that "ten thousand five hundred bear-skins were imported into England from the northern parts of America, and the number gradually increased until 1803, when it reached twenty-five thousand, the average value of each skin being estimated at forty shillings." This destruction has thinned the species, which, once common over North America, is on the eastern side now confined to the higher regions of Canada and the Rocky Mountains, but on the western coast is still abundant as far south as California.

Independent of the fur and general figure, the skull presents another ground of distinction between this and its European relative, being much narrower, the line of the forehead convex, and continued regularly without any break from the upper part of the head, and ending in a longer and more pointed muzzle.

The GRIZZLY BEAR is the most formidable and ferocious of the tribe, exceeding in size our European species. He is a native of the State of Missouri and the Rocky Mountains; his hair is long, harsh, and grizzled; his feet and paws are of enormous magnitude, and his strength is prodigious. The terror of the native tribes, he dwells the solitary monarch of his chosen ravine or dell, and bold must be the hunter that will venture to attack him in his strong-hold. Singularly tenacious of life, he has been known to receive five balls through the lungs and five through the body, not only without expiring on the spot, but swimming to a considerable distance, and surviving twenty minutes. Although his food is partly roots and

vegetable substances, still his appetite is ravenous for flesh. He will slay the huge and shaggy bison, and drag the body to his den, there to satiate his appetite, or dig a pit for its reception as a store of food for another day.

An animal of this species, distinguished by his enormous size and ferocity, is at present to be seen in the Gardens of the Zoological Society; and although he has been in confinement twenty years in the Tower, (to the collection of which he formerly belonged,) and continued attempts have been made to coax him into a gentler mood, his morose and indomitable temper remains as unaltered as if he were still at large, surrounded by the savage rocks and dark pine-trees of his native region.

The Bear is often adverted to in the scriptures, and with great force and beauty. When Saul discouraged David from the combat with the Philistine, David in reply informed the monarch that he had encountered and slain a *bear* which ravaged his father's fold, and, with a feeling of true piety, he ascribes his success not to his own prowess and courage, but to God alone, who, as He had delivered him out of the paw of the *bear,* would, he trusted, deliver him out of the hand of the Philistine. In confidence upon that God, whose protection he had experienced, and which he openly acknowledges, he goes forth not in his own strength, but in the assurance of faith, and conquers. And so must the christian. The Bear is a rugged and powerful adversary; so are the enemies with whom the christian has to contend; and in the outset of his pilgrimage, as if in trial, he will be called to numerous

conflicts: he is just emerging from the world, and the world will not let him go without a struggle. Sin will also endeavour to retain him with a murderous gripe, temptations will beset him, and his own passions will league against him; but in God he will overcome all: and then should future trials come, or other and severer conflicts await him, looking back upon the past, he will be able to say, as David when about to meet the Philistine champion, "The Lord hath delivered me out of the paw of the lion and the *bear*, he will deliver me out of the hand of this Philistine."

The young should especially remember the destruction of the forty-two profane youths of Bethel, by the two she-bears. They mocked the prophet of God, and so insulted the Most High, who thus punished their daring crime. 2 Kings ii. 23.

The Persian monarchy is figured as a Bear, Dan. vii. 5, rough, shapeless, savage, and voracious.

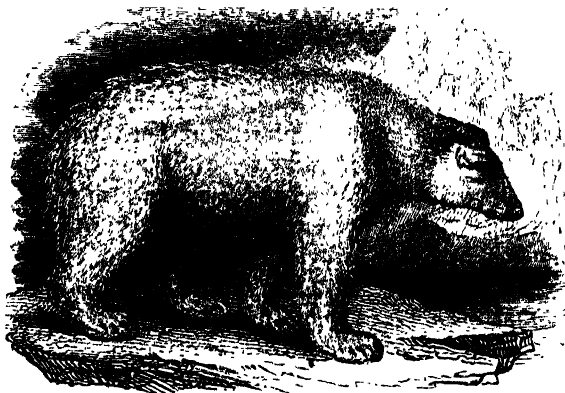
India produces several species of Bear, as the MALAY, TIBET, &c., agreeing with the rest of the tribe in general habits, but of less size, with short close fur, and claws remarkably long and curved, which, in conjunction with a lighter form of body, enable them to climb with greater facility.

From the mountains of India is also brought the SLOTH BEAR, (*Prochilus labiatus,*) of which two fine specimens exist in the Gardens of the Zoological Society. It is a rough clumsy animal, distinguished by the singular power of protruding or contracting the lips, which have great mobility, and are used for

reaching or collecting its food, consisting, it is said, of white ants, honey, and vegetables, for which it digs. Its claws are long and powerful; and with these it excavates holes or dens for its retirement.

In closing our sketch of this race, we shall present our readers with that celebrated species, a native of the polar regions, which, on the floating icebergs of a sea where the whale and "snorting sea-horse" flounder, secure from the weapons of man, and over interminable wastes of snow, braves the utmost intensity of cold, and dwells the stern and savage ruler of a stern and savage realm.

POLAR BEAR, *(Ursus maritimus.)* The accounts of



older navigators are full of the marvellous and extravagant with regard to the dimensions and ferocity of

this animal; but after every allowance for the magnifying effects of fear and novelty, the Polar Bear is a tremendous and formidable beast. Its average length when full grown appears to vary from six feet to seven; there are, however, instances on record of a much greater magnitude; for example, the specimen in the British Museum, brought home by Captain Ross from his late northern expedition, measured seven feet eight inches, and its weight, after losing it is calculated thirty pounds of blood, was eleven hundred and thirty-one pounds; and another individual is described by Captain Lyon as measuring eight feet seven inches and a half, its weight being sixteen hundred pounds.

The first and most striking character of the Polar Bear which distinguishes it to the eye of the non-scientific observer, is its colour, which is of a uniform white, with a tinge of straw-colour more or less prevailing. In its figure, though the limbs have the massive thickness peculiar to its race, there may be easily traced a striking distinction, referable no doubt to its almost aquatic mode of life. The contour of the body is elongated; the head flattened, with a straight profile; the muzzle broad, but the mouth peculiarly small. The neck, which forms a most remarkable feature, is continued twice as long and as thick if not thicker than the head, which is thus thrown out far from the shoulders, so as to give it a *poking* air. The paws are of huge dimensions, and covered on the under side with coarse hair, whence it derives security in walking over the smooth and slippery ice. The fur is long and woolly, except about the head and neck, but of fine texture, and considerable value.

On the inhospitable shores where the Polar Bear resides there are no forests to shelter him in their recesses; he makes the margin of the sea or the craggy iceberg his home, and digs his lair in the snows of ages. His *habitat* may be considered as bounded by the arctic circle, below which he does not willingly pass; the northern and western winds, however, often drift numbers on floating islands of ice to the coast of Siberia and the shores of Nova Zembla. On the northern coast of America, also, down to Hudson's Bay, the present species is by no means uncommon.

The Polar Bear is a strong and rapid swimmer, and dives with the utmost address; as a proof of which it is stated by Cartwright that he once witnessed a trial of skill between one of these animals and a salmon, which, notwithstanding the known velocity of the salmon's movements in the water, he succeeded in capturing. Indeed, if the Bear were not at home among the rough waves of the northern seas, he would be often much straightened for food, as his chief diet is obtained from the floating carcasses of whales and fishes, to which he must often swim far away from the shore. He wages also a perpetual war upon the seal and walrus, watching for them as they appear at the openings among the ice: nor does he refuse whatever animal exuviæ the waters cast upon the land, nor the few berries which the shrubs of these dreary regions afford.

From the best authorities the males do not hybernate, as is the case with the others of this genus, but brave the severities of winter upon the ice by the open sea, wandering along the margin, and swimming from

floe to floe in search of prey; the females, however, do not make their appearance, or less frequently, till the approach of milder weather, when they sally forth from their retreat accompanied by two cubs: at this period, gaunt, lean, and famished, they are especially formidable, hunger and the presence of their young adding to their ferocity.

The attachment of the females to their young is strong and enduring; they will fight till they die to defend them; they will swim after them when carried away with the utmost perseverance; they will moan over them, and try to raise and support them when wounded, nor leave the spot upon their death till forced by hunger, or they themselves be attacked in their turn. In the tales of a voyager to the arctic regions we are presented with several graphic narratives evincing the fondness of the bear for her young, and the danger of rousing her vengeance by destroying it. Referring to the mate of the Dundee, who nearly lost his life in an encounter of this kind, the writer says, "after killing the cub, he fired at her (the mother) and struck her on the jaw, which remained gaping as if dislocated, and, believing her *hors de combat*, he got upon the floe (mass of floating ice) to take possession of her slain offspring. The she-bear, though she had fled, now returned, and, rushing towards her enemy, threw him down, but was unable to mangle him, for her mouth was wide open and she had lost the ability to close it, nevertheless she mounted upon his prostrate body, and trampled it severely before the crew of his boat could come to his rescue. When they did arrive, a sailor who brought a gun lost his presence

of mind at the sight before him, and stood staring inactive; others more bold thrust the bear aside with lances, and the mate being freed from its weight arose, took the gun from its bearer and shot away the unlucky lower jaw of the beast completely. She then fell a victim to the weapons of his men."

A sailor who belonged to the crew of a ship employed in the whale fishery, once undertook to attack a large Polar Bear which he saw on the ice at a distance. It was in vain that his companions tried to persuade him to give up his design. He laid hold of a whale-lance, and approached the Bear; the Bear was, however, as brave as the sailor, and stood waiting for the attack. The sailor, seeing him so bold and powerful an animal, grew faint-hearted, and, after standing for some time motionless, took to his heels. The Bear pursued him with monstrous strides, when the sailor dropped the whale-lance, his cap, and then his gloves, one after another, to prevent the Bear from following him. Bruin examined the lance, tore the cap in pieces, and tossed the gloves over and over; but, not being satisfied with his spoil, he still pursued the sailor, whom he would, without doubt, have torn in pieces, had not the rest of the crew, seeing the danger of their companion, sallied forth to rescue him. The affrighted sailor ran towards his comrades, who opened to him a passage, and then prepared to attack the Bear. The Bear was, however, as prudent as he had proved himself to be brave; for, after surveying the force of his enemies, he effected an honourable retreat. The valiant sailor, who had fled before his courageous enemy, never stopped for a moment in his flight until he had

reached the boat, preferring to be laughed at for a coward, rather than remain to encounter a Bear. Let



the young remember that fool-hardiness is not real courage.

The maternal attachment of the Bear for her young is not, however, peculiar to this species; it is equally striking in all, and to this characteristic we find a beautiful allusion in Hosea xiii. 8: "I will meet them as *a bear bereaved of her whelps.*" In Samuel we find also another similar allusion, which conjures up a strong and graphic picture: "For, said Hushai, thou knowest thy father and his men, that they be *mighty* men, and they be *chafed in their minds as a bear robbed of her whelps in the field.*" 2 Sam. xvii. 8.* The scriptures are ever true to themselves, no flaw can be detected; and even in these passing references to the manner of animals we not only see great force, beauty,

and correctness, but an harmonious accordance dovetailing into the other portions, and stamping the whole with an irresistible air of genuineness and authenticity. The very style of the scriptures may be offered as evidence in their favour.

Passing from the Bears along the series of *plantigrade carnivora*, as they approach a point on the eve of merging into that division termed *digitigrade*, so as to constitute a sort of debateable ground, we meet with several genera highly interesting to the naturalist, as forming intermediate links between more conspicuous portions of the chains, and containing animals of no less interest to the general reader who loves to contemplate the First Great Cause of all, in the outgoings of His wisdom and power. From these examples we shall select a few of the most characteristic, commenting upon them in connexion with the particular genus to which they may belong. The first to which we turn is the RACOON.

The Racoon, with one or two allied species, is now separated from the bears, among which its station had been assigned by earlier writers, and forms the type of the new genus *Procyon*. That it should ever have been joined to the bears is a matter of surprise, as there is a wide difference in general aspect and habits between the sharp-nosed agile Racoon, with its slender limbs and long tail, and the heavy clumsy animals in whose company it was placed. The chief characters of the genus *Procyon* are as follow. The canine teeth are straight and compressed; the three last molares on each side are crowned with blunt tubercles; the

toes are five, armed with sharp nails; the tail long. Although, while resting, the entire sole of the foot is applied to the ground, the heel is raised in walking, so that little more than the toes comes in contact with the surface over which the animal passes, a peculiarity expressed by the word *semiplantigrade.*

The Racoon *(Procyon Lotor)* is exclusively a native



of America, being found from the borders of the Red River, N. Lat. 45°, down to Paraguay. Its habits are nocturnal; for the eyes, although the pupil is circular, are distressed by light. During the day, the Racoon, therefore, remains inactive, rolled up with the head between the hind legs, and sleeping away the time till the hour of darkness, when it begins to prey about with restless activity for food. Stealing to the river's

brink, the edge of the swamp, or the sea-shore, (localities which this animal especially affects,) it seizes crabs or shell-fish, or such of the finny tribe as come within its reach, not neglecting worms, insects, roots, and the succulent parts of the sugar-cane. Its dexterity in opening oysters we have personally witnessed. The animal which we saw exhibit this feat first broke the hinge with its teeth, by which means the shells were loosened; it then forced them apart with its fore-paws, dexterously hooking out the contents, which it seemed to relish exceedingly.

The Racoon climbs trees with great facility, and is one of those enemies against whom the birds have to guard, as it not only plunders their nests of eggs or young, but often surprises the parents while fostering their callow brood during the darkness of the night. If taken young this animal is easily tamed, and when permitted the liberty of a room manifests an insatiable curiosity, examining every thing within its reach, and hunting into every corner and crevice with unremitting assiduity. Though not capable of using the fore-paws, like a monkey, (there being no opposing thumb or pliability of finger,) still it manages to grasp any object by compressing it between both together, and in this manner, sitting upon its haunches, it will take its food, which, before eating, it usually dips into water. Water indeed seems essentially necessary, if not to its existence, at least to its health and comfort; and its specific name, *lotor*, or *washer*, is taken from the circumstance just alluded to, in connexion with its predilection for this element. The fur of the Racoon is soft and valu-

able; the hairs are of two kinds, one forming a short woolly undercoat, the other long and silky, ringed with black and white; the general tone of colour thus produced is gray; the face is lighter, with a black band encircling the eyes; the tail is bushy, and ringed with black and gray alternately; the nose is long and pointed, extending beyond the jaws; the body fat and round. A more intimate account of its habits in a wild state is still a desideratum.

Allied in many respects to the Racoon are those singular animals which, though not uncommon in our menageries, are yet little understood, namely, the *Coatis,* a tribe peculiar to the warmer regions of America, as Brazil, Guiana, Paraguay, &c. They form a genus under the name of *Nasua,* characterized, as is that of the racoon, by nocturnal habits, a semiplantigrade mode of progress, and a facility of climbing. The teeth and tail are also very similar. The nose is also elongated, but to an enormous extent, so as to form a prolongated snout, ending abruptly, and extremely flexible. Their body is, however, longer and more slender; their feet stronger, and well adapted for digging. Of the COATI, or COATI-MONDI, two species are known: the BROWN *(Nasua fusca)* and the RED *(Nasua rufa)* with several acknowledged varieties; some, indeed, have suspected this to be the case with the *brown* and *red,* as in habits, manners, and every particular, except colour, they precisely agree.

Of all the senses of this animal that of smell seems to be the most highly developed. The Coati examines every thing with its long nose, which it turns about in

all directions; and, as the animal is extremely inqui-



sitive, the powers of this organ are in perpetual requisition. In its wild state the Coati lives in small troops among the woods, where it climbs the trees with great address, and descends with the head foremost. Its food consists of small animals, birds and their eggs, reptiles, insects, and worms, which it searches for by digging with great avidity. The plantations of sugar-cane are said also to suffer from its fondness for the luscious juice. It is easily tamed, but is restless, irritable, and capricious, and consequently not to be touched without caution; its bite is very severe and dangerous. In the Gardens of the Zoological Society are to be seen several of these animals, one of which sometime since inflicted a serious wound on its keeper.

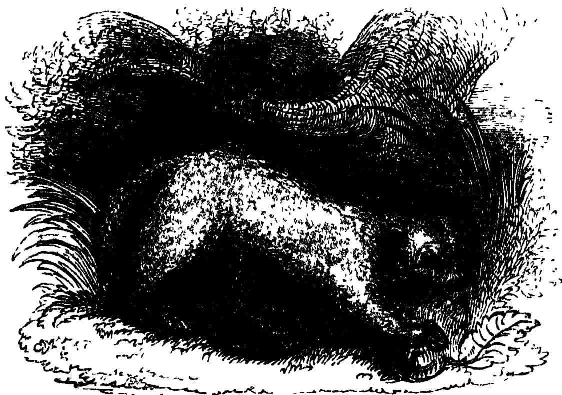
In size this animal is as large as a fox or racoon, although not so high, its length being two feet four or five inches. The tail is long and tapering; the ears

small and round. Its voice, when the creature is irritated or alarmed, is a singularly shrill cry; at other times it is silent, or utters only a gentle hissing.

To this place in the scale Cuvier and Lesson have assigned one of the most remarkable animals with which we are acquainted, the history of which at present is but imperfectly known. We allude to the KINKAJOU, the sole species as yet discovered of the genus *Cercoleptes*; the characters of which are these: incisor teeth in each jaw six; canines, one on each side, followed by five grinders, the two first of which are pointed, the other three blunt and tuberculous; the tail long and prehensile, but covered with fur; the muzzle short; the tongue long, slender, and very extensible; toes five, claws strong and hooked; mode of progression semiplantigrade.

The KINKAJOU *(Cercoleptes caudivolvolus)* is a native of the warmer regions of South America, where it is known by various names among the inhabitants of different districts. Baron Humboldt informs us that among the Musica Indians, in the Mesa of Guandiaz, it is called *Cuchumbi;* in the mission of Rio Negro *Manaviri;* names preferable to that usually given, which is a word of uncertain etymology, and said to be one of the appellations of a very different animal, namely, the glutton of North America. However this may be, we suppose it must be now retained. The Kinkajou is evidently nocturnal in its habits, searching for food at night, and remaining torpid during the

day, rolled up in some dark hole or crevice to avoid



the light, which is borne with difficulty. Its eyes are dark, the pupils round, and contracted almost to a point under the influence of the sun; the ears are round; the fur thick, close, and of a pale yellowish white; the naked soles of the feet and paws flesh-coloured.

We learn from the observations of Baron Humboldt that this animal is a great destroyer of the nests of wild bees for the sake of obtaining the honey, of which it is very fond; hence the missionaries from Spain have given it the name of Honey-bear. Its usual food, however, appears to be small animals, birds, eggs, insects, and fruits. Its size is that of a cat, but its limbs are shorter, and much more thick and muscular. Our scanty knowledge of the native habits of this

beautiful animal may perhaps in some measure be atoned for by the observations we have been enabled to make upon an individual which for two or three years past has been living in the collection of the Zoological Society, where, from its playfulness and good nature, it is regarded as an especial favourite. During the day it usually reposes in a little inner den, but by no means constantly, as, especially in the afternoon, it will come out from time to time and readily engage in play with those to whom it has been accustomed, pretending to bite, and twisting itself into a variety of antic positions. It is, however, during the dusk of the evening that its energy is fully awakened; then, full of play and frolic, it will leap about its cage, climb to the top, and, suspending itself with its hind claws and tail to the wires, swing backwards and forwards in all the exuberance of animal enjoyment; then, suddenly bringing its fore-paws up, it will traverse the top with its back downwards, displaying no little address and activity. During its gambols it is ever protruding its long tongue, and it does so when food is presented on the outside of the cage which it wishes to obtain. Baron Humboldt says this organ is made use of to suck the honey from the bees' nests; we suspect that it is also an instrument (as are the long tongues of many other animals) for the purpose of inserting into crevices for insects, eggs, and other food. It laps its drink like a dog. It uses its fore-paws, which are remarkably strong, like a bear, and sometimes to convey its food to its mouth, but by no means always. Having thus continued in lively and active exercise all the night, it invariably retires

to bed with the first beams of the sun, where, if undisturbed, it will rest during the forenoon; in the after part of the day, as we have mentioned, it will begin to exhibit signs of returning animation, which become more and more decided as day draws near its close. In its aspect, which, under an appearance of inoffensive mildness, conceals a fierce spirit, (dormant, it is true, in captivity,) there is something not unlike that of a lemur; the head is, however, broader, and the muzzle shorter, with a greater appearance of strength and firmness.

From the Kinkajou we pass to the genus *Meles*, of which our well known BADGER, *(Meles vulgaris,)* is the type.



With the history of this animal every one is sufficiently familiar; it is a peaceful and harmless native

of our woods, dwelling in burrows of its own digging, whence it is often dragged to gratify the brutal lovers of cruelty, who, in the desperate resistance which it makes against dogs trained for the combat, find a pitiful and cowardly recreation. The days of bear and badger baiting are, however, fast declining; and these inhuman sports, now no longer the pastimes of a court, linger only amongst the debased and unenlightened dregs of the community. Time was when a maiden queen would honour the bear-pit with her presence, and witness scenes of unexampled and disgusting brutality, not only without indignation, but with interest and ardour. Such is the case in Spain at the present day, where ladies throng the arena to witness the inhuman spectacle of the bullfights, the modern *fac simile* of those scenes of carnage which tarnished the splendour of Rome, and the character of the Roman people. In all this we see the force of *custom*, which reconciles the heart to that, from which, if presented as a novelty, it would recoil with horror; *custom*, which too often laughs virtue out of countenance, and holds up that which ought to be desecrated as a pattern for imitation. The moral tone of feeling pervading a community depends upon the diffusion of light, and the nature and tendency of those early lessons which, imbibed in childhood while the heart remains unprejudiced and free, form the character and silently bias every action. Hence as it regards the great outline, the grand duties of life, how just is the admonition of Solomon, "Train up a child in the way he should go, and when he is old he will not depart from it!" According to the diffusion of education, and the nature

of that education, will the moral standard of a nation be elevated or depressed. That spectacles of cruelty and torture have so far disappeared from our land, and are no longer supported by popular opinion, is owing to the spirit of that book breathing mercy to man, and mercy to every creature, which is alike in the hands of the child and its parent, the rich and the poor, and which, it must be evident to every reflecting mind, is rapidly making a visible impression upon the face of society at large.

To return. The animals which seem to conclude this section and connect it to that which follows are the GLUTTONS, included in the genus *Gulo;* although semiplantigrade in their walk, they resemble the great tribe of weasels in their teeth, and in their thoroughly carnivorous propensities, as well as in their lengthened form of body. The incisor teeth are six in each jaw; the canines, one on each side, followed by three false molars above and four below. The *laniary molar,* which began in the badger to exhibit its true character, is here well developed, and succeeded by a tuberculous back-tooth both above and below. The most celebrated species is the GLUTTON of the North, the Rossomak of the Russians, the Wolverene of Canada, *(Gulo arcticus.)*

In size the Glutton is equal to a badger, but its body is more slender, and its activity much greater; its colour is chestnut, verging in some instances towards black; its head is something like that of the polecat, but broader, and indicates greater strength of jaw; the fur on it is also shorter than that on the

other parts of the body. It inhabits the arctic regions



of both continents, those of America being paler than those of Russia. The nature of the Glutton, as its name imports, and its laniary teeth indicate, is voracious and bloodthirsty in the extreme; and were its size equal to its appetite, it would be one of the most formidable of animals. Notwithstanding its savage disposition, it is however capable of being tamed, and becomes playful and affectionate. In a state of liberty it leads a life of rapine; and when pressed by hunger is said to have recourse to artifice and stratagems in order to obtain its prey; it will watch for the slow-paced beaver as he comes from his house, or pursue him on land; or, lurking on the horizontal branch of a tree whose trunk is covered with moss and lichen, the favourite food of

the reindeer, it will drop upon the hapless animal the moment it approaches, fix its teeth into a vein, and never quit its hold till, exhausted with pain and loss of blood, the miserable victim sinks and expires. In this manner horses and domestic cattle are said sometimes to fall a sacrifice to its ferocity. The fur hunters experience much mischief from its ravenous propensities, as it not only robs their traps of the bait, but seizes upon the martens or sables when caught, and devours them before the hunters can prevent the depredation, thus destroying in one night, (the period of its active search for food,) a valuable booty, which weeks perhaps have been painfully spent in obtaining.

The gluttons, which end the *plantigrade section* of the Carnassiers, conduct us to the next section, or *Digitigrades*, through a family which Cuvier places at the beginning, and which is indeed little else than a continuation of the previous or concluding one of the *plantigrades;* the boundary line, as is often the case with two kingdoms, being more conventional than broadly indicated by nature, and, to keep up the simile, it is only as we proceed that the features assume a bolder and more decided form, till arriving in the centre we find ourselves surrounded by objects bearing the marked impress of difference, and proclaiming a wide separation from the point whence we started; but the change has been so gradual during our progress that we must pause and reflect, in order to feel the full force of the distinction.

It is thus that we pass *from* the *previous section* to the *present*, namely, that of the *Digitigrades*, of which

we shall sketch the leading features before entering upon the subordinate parts composing it.

In the digitigrade section are comprehended the most typical of the order, or, in other words, such as present those qualities in their maximum of developement which essentially belong to it. Instead of the entire sole of the foot the toes only are applied to the ground in progression, and the step is free, light, and active. In comparison with their size the muscular powers are very great, and their system is capable of enduring long fatigue and hunger; the appetite is however voracious, and the disposition bloodthirsty and cruel. For graceful elasticity of motion, beauty of fur, and elegance of form, the animals of this section claim a preeminent station; but they are the tyrants of their race, and, possessing weapons which enable them to destroy others far exceeding themselves in size, they lead an almost unchecked life of rapine. Having slain their prey, they gorge on the bloody repast, and then become listless and torpid, till hunger rouses them to renewed exertion. The habits of by far the greater number are nocturnal; slumbering during the day in some retired den or deep recess, they begin their prowl as the shades of evening gradually blend all things into murky indistinctness; their step is stealthy and noiseless, so that the fated victim is not aware till too late of the presence of the destroyer. Thus they roam about till the first rays of the dawn, when they retire to their lair; "the sun ariseth, they gather themselves together, and lay them down in their dens." Some, however, act on a more open system of warfare, and hunt down their prey, in concert, in the face of day.

The first subdivision of the digitigrades comprehends a race to which, as we have said, the Gluttons, *(Gulo,)* of the former section, naturally conduct us; namely, the tribe of WEASELS, the *Mustelæ* of LINN. Ray termed them vermiform (or worm-like) mammalia, from their slender elongated figure. Their dentition, though not so decided as in the feline tribe, sufficiently indicates their carnivorous propensities; a single tuberculous tooth succeeds the laniary molar on each side in the upper jaw. When pressed by hunger, although vegetable food is alike alien to their taste and appetite, they do not altogether refuse it. Their relish for blood is strong, and their great inferiority of size alone prevents their being among the most formidable of animals. In the pursuit of their prey they are bold, cautious, and determined, and their bite is keen and deep; they generally fix upon a vital part, most commonly behind the ear, where the internal jugular or some large vein invites them, and there hang till their victim expires: they have been often known to turn resolutely on man himself.

Their head is small, oval, and flattened; their form is snake-like, and their pliability of body so great as to enable them to insinuate themselves into holes and crevices where it could hardly be supposed possible for them to enter; nor are they less remarkable for climbing with the utmost celerity and adroitness, a faculty which their short strong limbs and sharp claws bestow upon them. Their habits are more or less nocturnal. The Weasel tribe, formerly constituting the single genus Mustela, is now divided into several genera, of which the chief are *Putorius*, comprehending

the *Polecats; Mustela,* the *Martens; Mephitis,* the *Mephitic Weasels;* and *Lutra,* the *Otters.* To this list may be added that of *Mydaus,* which, as well as the genus *Lutra,* is by some authors removed from the present situation. We prefer the arrangement adopted by Cuvier.

The genus Putorius is so called from the offensive odour peculiar to the species composing it, which renders their presence disagreeable. Their disposition is bold and sanguinary, conjoined to great bodily activity. The laniary molars below are smooth and acute; the false molars are two above and three below; the head is triangular; the muzzle short; the ears small and rounded; the toes five. Several of the species are indigenous to our islands, namely, the Polecat, Weasel, and Stoat. The Ferret, introduced from North Africa, breeds freely in confinement. The foreign species are very numerous.

The Polecat, *(Putorius communis,)* is the one so especially disliked by farmers from the havoc it makes in the poultry-yard, where it slaughters fowls, pigeons, and rabbits without mercy, apparently for the sake of the blood alone, since, unless its prey is scarce, it seldom carries away the bodies of its victims. It extends its ravages also to the preserves of game, and warrens, destroying hares, pheasants, eggs, and broods of young. It would appear too that, when pressed by hunger, the finny tribes themselves are not safe from its depredations. Bewick mentions a case in which "eleven fine eels," the fruits of its nocturnal exertions, were taken out of the hole of one of these marauders; this occur-

rence took place in winter, doubtless during a season of scarcity, when necessity became, as usual, the parent of invention. The length of the Polecat is sixteen or eighteen inches, exclusive of the tail, which is four or five. The fur is of two sorts, one short silky, of a pale yellow, which forms an undercoat; the other long and coarser, of a dark chocolate brown, which, except in the under parts where these hairs are thin, is the prevailing colour. Woods, copses, or deserted buildings are the places where it dwells, digging for itself a subterranean retreat at the foot of a rock, an old wall, or among the gnarled and twisted roots of a tree, but not unfrequently taking possession of a burrow previously made, whose original tenant has served it for a meal.

The WEASEL, *(Putorius vulgaris,)* is too familiar to require particular notice; its destructiveness among young broods of poultry, and its antipathy to rats and mice, which it attacks with the utmost eagerness, are known to all. Notwithstanding the wildness of this little animal, several instances are on record of its having been completely tamed, when, with the playful vivacity natural to it, it has manifested an unexpected, and therefore the more interesting degree of affection.

The STOAT, *(Putorius ermineus,)* is widely spread, being found in Europe, Asia, and we believe America; it closely resembles the weasel, but is a full third larger, and is besides distinguished by a singular change of dress, which in that animal is not found to occur. During summer its general colour is a pale

reddish brown, but this, as winter comes on, gradually changes to a pure white, which becomes universal except at the tip of the tail, which is at all times black. In its winter livery it is known under the name of *Ermine*, and its fur is a valuable article of commerce, being imported in large quantities from the north of Europe, where it especially abounds. In England, the Stoat seldom assumes so complete a purity of whiteness or such closeness of fur as it does in Norway or Siberia. We have, however, seen some from Ireland of exceeding beauty. Its predatory habits are the same as those of its relatives.

The FERRET, *(Putorius furo,)* is known in England only as a domesticated quadruped (if indeed an animal manifesting neither attachment nor those acquired habits of dependance which indicate true subjection can be called domesticated,) having been most probably introduced at an early period into Spain from Africa, whence it has been spread over Europe.

Among the foreign species we may notice the CAPE POLECAT, or ZORILLE, *(Putorius Capensis.)*

In habits and manners a strong family resemblance runs through the members of this group, binding as it were together even species inhabiting distant and opposite portions of the globe, and stamping them with a sameness which cannot be mistaken. The Cape Zorille, however, betrays a departure in a few minor points from the typical characters, as it differs in colour, in the texture of its fur, and the strength of its claws from its northern congeners; circumstances

which have led some authors to form it into a distinct genus under the name of Zorilla. The Zorille is a



native of Africa, where it lives in burrows or holes of its own excavating; hence the claws of its fore feet are remarkably powerful, and well adapted for its work. Its hair is long, coarse, harsh, and moderately thick on every part of the body; the head being excepted, where it is short and smooth. Its colour on the back is an irregular mixture of black and white longitudinal stripes; the head is black, with a white oval mark on the forehead, and a white mark occupying the space between the eyes and the ears; the under surface and limbs are wholly black. The diversity which takes place in the arrangement of the stripes among individuals, all called Zorille, has led to a belief of there being several distinct species, which, though closely allied, differ amongst each other in minor particulars, a circumstance the more probable as it is in conformity with those laws which the Great

Creator appears to have laid down in the general arrangement of nature.

In the Cape Zorille, the tail, which is furnished with long hairs, is carried erect, and the hair spread, so as to form a plume: in this respect, as well as in style of colouring, though not in its dentition, it betrays an approximation to a race peculiarly American, distinguished by an overpowering odour, which, if not entirely absent, is neither so disgusting nor enduring in the present animal nor in the rest of the subdivision in which it is at present placed.

The MARTENS, *(Mustela,* CUVIER,) differ in a very trifling degree from the Putorii by the addition of a false molar tooth on each side above and below, and by a little tubercle on the inner side of the laniary molars of the lower jaw. As their distinctive characters but slightly remove them from the foregoing race, so are they as little separated in their habits and disposition. The fur of all the species is exquisitely soft and beautiful; that of the PINE MARTEN, *(Mustela Abietum,)* is highly prized, and an article of extensive commerce. The animal is found in the immense forests of the north, both of Europe and America, where it lives like a squirrel among the trees, which it climbs with the utmost facility; it is said to usurp the nest of a squirrel or bird, the original possessor of which has fallen a sacrifice to its rapacity; and in this homestead, which another's labours have founded, the female rears her young. The general colour of the fur, which consists as is usual of two sorts of hair, is a deep chestnut, except on the throat and margin of the

ears, where the chestnut colour gives place abruptly to a fine yellow: in summer the tints not only become lighter, but the fur shorter; and the toes, which during the winter were well protected with woolly hair, are deprived of their covering, and the claws are completely exposed.

A still more celebrated fur is that of the SABLE, *(Mustela Zibellina,)* a single skin having, it is said, sometimes sold for fourteen or fifteen pounds; the average ratio is, however, from one to ten pounds, according to the quality, there being great difference according to the time of the year, the age and state of the animal when killed: the darker the colour the more is the fur esteemed. The bellies, of about two fingers' breadth, are we believe sold separately in bundles of forty pieces, each piece consisting of a pair; these bundles are stated, we know not on what authority, to be worth from one to two pounds each. The skin of the throat, called in the furriers' shops *gills*, and that of the tail, are also sold separately. The Sable fur may be distinguished by the hairs lying any way in which they may be placed; very little of the true kind finds its way into our market, the fur of several of the American species of Marten, which is very beautiful, passing in its stead.

An animal producing an article of luxury so prized by the fair sex throughout the whole of Europe, cannot fail to be an object of interest and curiosity; we know, however, but little respecting it, and that little from confused and almost contradictory statements. A writer distinguished for his talents and depth of

research, begins an elaborate paper on the Pine Marten, (see "Gardens and Menagerie of the Zoological Society delineated,") by observing that "the animals of the weasel family have long been classed among the torments of zoologists, and few have a better title to be so considered than those which constitute the genus Mustela as restricted by Cuvier." In confirmation of this opinion we have but to turn to the present animal, respecting which it is as yet a matter of some uncertainty whether it be not in fact identical with the pine marten, varying only in characters produced by age, climate, or other causes. The principal differences appear to consist in the uniform yellow of the throat of the pine marten, which in the Sable is cinereous and irregularly mottled; added to which the size of the latter is rather larger, its muzzle a degree more elongated, and its tail shorter; the head being of a gray colour, passing into brown on the muzzle, and hoary about the eyes. Such at least are the chief characters as given by Pallas, who drew his details from a personal acquaintance with the animal during his travels in Siberia. The same may be said also of Gmelin, whose description was accompanied by a figure so truly bad as to be of no avail. The general colour, however, as he details it, differs considerably from the account of Pallas, affording at least a strong presumptive evidence of "great variation in different animals, and at different seasons." Among other writers from Linnæus downwards none appear to have inspected the living example, therefore their works afford no certain guide. Still, however, notwithstanding the distinctive characters between the Sable and the pine

marten are so ill made out, and even so contradictory as to leave the subject in a maze of intricacy, we cannot but acquiesce in the assertion of Pallas, who affirms decidedly that the species are truly distinct.

The Sable is a native of Siberia, inhabiting the forests and mountains of that inhospitable region, where its chase is one of the most painful and arduous of labours which can fall to the lot of a wretched exile or desperate hunter. The pursuit takes place in the winter, (at which time the fur is the finest and most valuable,) and the hunters in small troops carrying with them their store of provisions, which too often fail, press onward over frozen plains where many a tempest sweeps, into the bosom of mighty woods where no vestige of human beings, save themselves, cheers the bleak and savage scene; following the tracks of the animals over the snow, night and day, with enduring perseverance. Various are the methods used for taking them: some are shot with single ball, some caught in traps, some pursued to their retreats, and nets are placed over the entrance, while the hunter, suffering from cold and often unheard-of privations, has to watch perhaps for days before he can entrap his booty. Who can picture to himself without shuddering the case of the condemned Sable-hunter? he leaves with heavy heart the last thinly scattered habitations which border the pathless wilds; a sky of clouds and darkness is above, bleak mountains and gloomy forests before him; the recesses of the forests, the defiles of the mountains must be traversed; there are the haunts of the Sable. The cold is below Zero; but the fur will prove the finer! Nerved by necessity, and stimu-

lated by the hope of a share in the gains, on he presses. Fatigue and cold exhaust him; a snow storm overtakes him; the bearings or way-marks are lost or forgotten; provisions fail; and too often he who promised to his expecting and anxious friends a speedy return, is seen no more for ever.



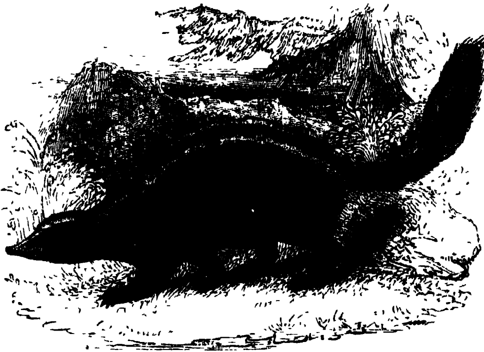
Such is Sable-hunting in Siberia, and such the hapless fate of many an exile, who perishes in the pursuit of what only adds to the luxuries and superfluities of the great. But it is ever thus in the chase of the follies, the trifles, and the things of time; the pursuit is arduous and painful, and the object comparatively worthless, or, if of value, to be possessed only for a season and parted with for ever. Man seldom labours so earnestly in the pursuit of knowledge, and still less so in the pursuit of a richer prize—"*the pearl of great price,*" a treasure exceeding the riches of the universe; but who sees the value and beauty of this till called out of darkness into light?

Besides the above examples of the genus *Mustela*, our British Isles present us with the BEECH MARTEN, (*Mustela fagorum,*) distinguished by its white throat; India with that beautiful species the *Mustela flavigula;* and America with several.

The next genus is that of the MEPHITIC WEASELS, (*Mephitis*, CUVIER,) so called from their intolerable odour. Their dentition is characterized by two false molars above and three below; the upper tuberculous tooth very large, and as long as broad; and the laniary molar of each side in the lower jaw having two blunt projections on its internal aspect. The nails of the fore feet are strong and well adapted for digging; the distinguishing colouring of the genus is black, rather abruptly cut up on the back by longitudinal stripes of white; the tail is long and bushy. These animals are slow in their movements, and have neither the graceful contour of figure nor the fine and beautiful fur of the Putorii and Mustelæ, nor do they possess propensities so thoroughly carnivorous, or a disposition so daring. Their means of defence consist in the property they possess of emitting at will a peculiar liquid secretion, the odour of which is so horribly disgusting that every animal retreats dismayed from their presence. Few dogs can be brought to stand it, and then only by keeping their noses to the earth. A single drop on a garment renders it for ever useless, as it can neither be purified by washing or exposing to the air, and the whole house is tainted where it is suffered to remain. Such is the Yagouaré of South America, described by D'Azzara, who declares that he was not even able to

endure the disgusting odour which a dog that had unfortunately received it from this animal a week before communicated to some furniture, although the dog had undergone the ordeal of washing and scrubbing with sand above twenty times.

One of the most celebrated animals of this genus, which abounds in ill defined species, is the SKUNK of America, *(Mephitis Americana.)*



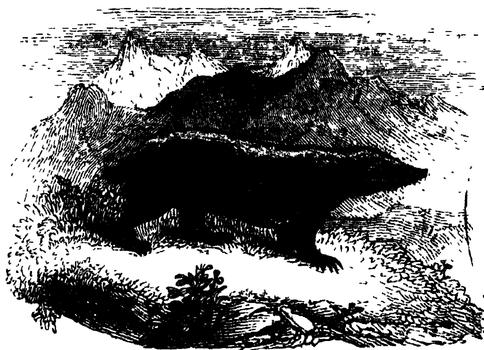
The general colour of this animal is black, with two white marks, subject to some variation, passing from the occiput the whole length of the back; a white line also passes down the forehead. The body measures eighteen inches, the tail about twelve. The nose is long and slender; the ears very small, and rounded; the hair long and coarse. Its odour is painfully insupportable both to man and beast. Mr. Audubon relates a humorous anecdote of a gentleman in Ame-

rica, who, not being acquainted with the *demerits* of this animal, incautiously pursued one, met with on the way-side during their journey, and received as a lesson never to be forgotten such a sprinkling of the pestilential liquid, as not only nearly poisoned him, but rendered him a walking terror, from which all retired with dismay; nor did his cloak ever lose the effluvium. Among others who have experienced the same fate, it appears that "Mr. Skidder, the owner of the New York Museum, had a set of clothes spoiled, which, after washing, were hung upon the roof of his house full fifty feet high, and yet could be smelt very distinctly some distance off in the streets, or the square near the house;" and it is related of Professor Kalm that he was once "nearly suffocated by one that was pursued into a house where he slept." In fact, though formidable neither on account of its teeth nor its claws, the Skunk possesses one of the most efficacious of weapons in the armoury of nature.

Another animal allied to the Mephitic Weasels is the TELEDU of Java, *(Mydaus meliceps.)*

This singular species, a native of Java and Sumatra, which forms the type and as yet the only species of the genus *Mydaus*, HORSF., agrees in many respects with the mephitic weasels of America, but differs in several essential particulars, especially in the hog-like form of the head, the almost total absence of tail, (which is a mere brush,) its nearly plantigrade mode of walking, and its habits of turning up the earth with its snout like a pig. Its proportions are heavy, its neck short and thick, its eyes small and placed high

on the skull, its ears small and nearly concealed by the hair; its odour is similar to that of the skunk, and



equally offensive; its size is about the same. The crown of the head, a stripe along the back, and the tip of the tail, are of a faded straw-colour; the rest of the body being of a dull chestnut bordering on black. The warm clothing of long hair in which the Teledu is enveloped proclaims it to be a native of at least a temperate climate; and accordingly we find it not in the burning plains of Java, but along the mountain ridges, where the temperature approximates to that of our northern clime. It is to that celebrated naturalist, Dr. Horsfield, who, during a long residence in Java, investigated the history of this and many other animals, of which little had been previously known, that we are indebted for our information respecting the present species: availing ourselves of his account, we take the liberty of presenting the following interesting

extract: "The Mydaus Meliceps presents a singular fact in its geographical distribution. It is confined exclusively to those mountains which have an elevation of more than seven thousand feet above the level of the ocean; on these it occurs with the same regularity as many plants. The long extended surface of Java abounding with conical points which exceed this elevation, affords many places favourable for its resort. On ascending these mountains, the traveller scarcely fails to meet with our animal, which, from its peculiarities is universally known to the inhabitants of these elevated tracts; while to those of the plains, it is as strange as an animal from a foreign country. A traveller would inquire in vain for the Teledu at Batavia, Semarang, or Surabaya. In my visits to the mountainous districts I have uniformly met with it, and, as far as the information of the natives can be relied on, it is found on all the mountains. It is, however, more abundant on those which, after reaching a certain elevation, consist of numerous connected horizontal ridges, than on those which terminate in a defined conical peak. Of the former description are the Mountain Prahu and the Tengger Hills, which are both distinctly indicated in Sir Stamford Raffles' Map of Java: here I observed it in great abundance. It was less common on Mountain Gede, south of Batavia; on the Mountain Ungarang, south of Semarang; and on the Mountain Ijen, at the farthest eastern extremity; but I traced its range through the whole island. Most of these mountains and ridges furnish tracts of considerable extent fitted for the cultivation of wheat and other European grains. *Certain extra-tropical fruits*

are likewise raised with success; peaches and strawberries grow in considerable abundance, and the common culinary vegetables of Europe are cultivated to great extent. To most Europeans and Chinese a residence in these elevated regions is extremely desirable; and even the natives, who in general dislike its cold atmosphere, are attracted by the fertility of the soil, and find it an advantage to establish villages, and to clear the grounds for culture. Potatoes, cabbages, and many other culinary vegetables, are extensively raised, as the entire supply of the plains in these articles depends on these elevated districts. Extensive plantations of wheat and of other European grains, as well as of tobacco, are here found, where rice, the universal product of the plains, refuses to grow. These grounds and plantations are laid out in the deep vegetable mould, where the Teledu holds its range as the most ancient inhabitant of the soil. In its rambles in search of food, this animal frequently enters the plantations and destroys the roots of young plants: in this manner it causes extensive injury; and on the Tengger Hills particularly, where these plantations are more extensive than in other elevated tracts, its visits are much dreaded by the inhabitants. It burrows in the earth with its nose in the same manner as hogs; and in traversing the hills, its nocturnal toils are observed in the morning in small ridges of mould recently turned up.

"The Mydaus forms its dwelling at a slight depth beneath the surface in the black mould with considerable ingenuity. Having selected a spot, defended above by the roots of a large tree, it constructs a cell

or chamber, of a globular form, having a diameter of several feet, the sides of which it makes perfectly smooth and regular; this it provides with a subterraneous conduit or avenue, about six feet in length, the external entrance to which it conceals with twigs and dry leaves. During the day it remains concealed like a badger in its hole; at night it proceeds in search of its food, which consists of insects and their larvæ, and of worms of every kind: it is particularly fond of the common lambrici, or earth-worms, which abound in the fertile mould. These animals, agreeably to the information of the natives, live in pairs; and the female produces two or three young at a birth."

Its motions are slow, and it is easily taken by the natives, who, whenever they can surprise one suddenly, prepare it for food, "as the flesh is then scarcely impregnated with the offensive odour, and is described as very delicious." The effluvium of the Teledu when irritated spreads to a considerable extent, and is so overpowering as to produce in some persons fainting.

The concluding genus of this subdivision is that of the OTTERS, *(Lutra,)* the dentition of which is thus characterized: three false molars above and below, a strong projection on the upper laniary molar, and a tubercle on the internal side of the lower; these are succeeded both above and below by a tuberculous molar large and strong.

The fur of the Otters consists of a short close waterproof vest, and a long silky shining upper coat; the head is flattened, the muzzle blunt, the body elongated, with short strong limbs and webbed feet; the

tail flattened horizontally; and the whole conformation adapted for aquatic habits.

The species composing this genus are pretty numerous, and from almost every quarter of the globe, exhibiting a close agreement amongst each other in form and manners; our notice therefore will not extend beyond the well known example common to the British Islands and the whole of Europe.

The OTTER, *(Lutra vulgaris,)* is one of those mam-



malia commonly termed *amphibious;* it is, indeed, capable of continuing several minutes under water, and there it pursues its prey. But the term *amphibious,* with regard at least to warm-blooded animals, ought to be excluded from the scientific vocabulary, since, as *popularly used,* it conveys an erroneous idea; for though many mammalia are denizens of the mighty deep, born and living amid the "waste of seas," still (as the whale) they breathe air, and cannot exist

except for a very limited period below the surface; in short, they differ from other mammalia in nothing, unless in the wonderful adaptation of outward form for the locality appointed them by the great Creator.

The Otter was formerly abundant, and is still found plentifully along the more secluded rivers and lakes of our island, where it makes great havoc among the finny tribes, which constitute its sole food. Nothing can be more graceful or easy than its motions in the water, in which it dives and glides along as if without the slightest effort, displaying the most beautiful and serpent-like evolutions.

To see the Otters feed in the Zoological Gardens is one of the most interesting of spectacles, the clear water allowing the exertions of the fish and the manœuvres of the pursuer to be distinctly traced.

The Otter is fierce, wild, and shy; its habits are principally nocturnal; its retreat is in general a burrow by the water's edge, extending to some distance in the bank, and concealed by overhanging brushwood, tangled briars, and herbage, or by the roots of some old tree; in this it makes a bed of dried grass and leaves.

Hunting the Otter has been a favourite but cruel sport. The moment he is discovered he betakes himself to the water, where he is more than a match for the strongest dog. Wearied out by his exertions to escape a multitude of foes, assailed on every side, covered with wounds, or transfixed with spears launched at him as he rises to breathe, still his determined courage holds out to the last, and he dies without uttering a cry.

The Otter is far from being destitute of intelligence

and docility: notwithstanding its native fierceness, it may be easily tamed, and has indeed been frequently kept in a state of domestication. Bewick tells us of one kept some years since by a James Campbell, near Inverness, which that person employed very successfully in salmon-fishing; it would sometimes take eight or ten in a day, and was always rewarded with a due share of the booty. It followed its master like a dog, and displayed great confidence and attachment.

Few animals exhibit more solicitude for their young. Professor Steller, who notices the strength of this instinctive tenderness, says, "Often have I spared the lives of the female otters whose young ones I took away. They expressed their sorrow by crying like human beings, and followed me as I was carrying off their young, which called to them for aid in a tone of voice very much resembling the crying of children. When I sat down in the snow, they came quite close to me, and attempted to carry off their young. On one occasion, when I had deprived an otter of her progeny, I returned to the place eight days after, and found the female sitting by the river listless and desponding, who suffered me to kill her on the spot without making any attempt to escape. On skinning her, I found she was quite wasted away from sorrow for the loss of her young. Another time I saw at some distance from me an old female otter sleeping by the side of a young one about a year old. As soon as the mother perceived us, she awakened the young one and enticed him to betake himself to the river; but as he did not take the hint, and seemed inclined to prolong

his sleep, she took him up in her fore paws and plunged him into the water."

To the above extract we cannot forbear adding the following from the late Bishop Heber:—

"June 27. We passed, to my surprise, a row of no less than nine or ten large and very beautiful otters, tethered, with straw collars and long strings to bamboo stakes, on the bank. Some were swimming about at the full extent of their strings, or lying half in and half out of the water; others were rolling themselves in the sun on the sandy bank, uttering a shrill whistling noise as if in play. I was told that most of the fishermen in this neighbourhood kept one or more of these animals, who were almost as tame as dogs, and of great use in fishing, sometimes driving the shoals into the nets, sometimes bringing out the larger fish with their teeth. I was much pleased and interested with the sight. It has always been a fancy of mine, that the poor creatures whom we waste and persecute to death for no cause but the gratification of our cruelty, might by reasonable treatment be made the sources of abundant amusement and advantage to us. The simple Hindoo shows here a better taste and judgment than half the otter-hunting and badger-baiting gentry of England."

We here close the *first subdivision* of the *digitigrade section* of the *Carnassiers*, a department yet requiring much elucidation. The retiring and distrustful nature of the animals, and the remote and almost inaccessible localities which most frequent, prevent us from becoming so intimately acquainted with the minutiæ of their

habits and instincts as to be able to assign to each any peculiar or exclusive qualities, save such as are common to the whole. Still we see enough both to interest and instruct us, and may glean facts to be added to the multitudinous proofs of the care and wisdom of our God.

We now arrive at the *second subdivision* of the *Digitigrades*, the characteristics of the dentition of which consist in there being two flat tuberculous teeth on each side behind the carnivorous of the upper jaw, this latter being itself furnished with a large protuberance.

The first genus under this subdivision is that of the Dog Tribe, (*Canis.*) The following are its characters. Three false molars above, four below; behind each carnivorous two tuberculous teeth, the first of which in the upper jaw is large and strong; the carnivorous tooth of the lower jaw has its posterior part also tuberculous. The canine teeth are strong, conical, pointed, and curved slightly backwards; the incisors are six above and below. The toes are five on the fore legs, and four on the posterior, to which a small rudimentary claw is sometimes superadded. The genus *Canis* includes the *Dog*, the *Wolf*, the *Jackal*, and the *Fox*, between which there subsists a close similarity both in anatomical conformation and external characters. Notwithstanding their appetite is decidedly carnivorous, they not only do not refuse, but in some cases are partial to a meal of vegetable aliment; dogs will feed freely on farinacious vegetables, and the fox has been celebrated for his love of the fruit of the vine, to which

there is an allusion in the Song of Solomon, chap. ii. ver. 15, where, however, the word fox may be understood to mean the jackal, this being the animal most probably indicated. The old fable of the "Fox and the Grapes," known to every child, has no doubt arisen from a knowledge of the animal's propensities. Still, however, the main dependence of this race of animals is the produce of the chase, or carrion which accident throws in their way, and for the discovery of which their acute sense of smell is expressly adapted. Their strength, especially about the jaws, is very great; their appetite is ravenous, but they can endure hunger and fatigue well; with plenty before them they gorge to repletion, and hide or bury the remainder for a future day. The habits of all, with the exception of the dog, are principally nocturnal; yet in the fox alone the pupil of the eye contracts in a linear manner; in the rest it is circular.

The first animal which claims our notice is the Domestic Dog, (*Canis familiaris.*) The Dog has been from time immemorial the friend and companion of man; yet its original stock still remains a matter of doubt and uncertainty, since, excepting the wolf and the jackal, we know of no *wild beast of the forest* to which we can refer with any thing like probability as its primeval ancestor; nor is it less difficult to say whether the endless breeds which are now found in every part of the world are all the descendants of one and the same stock, or of different but allied species; as far as we can learn from the relics of history the race has ever been as now, varied in its breeds and

qualifications. It is true that several sorts of wild dogs exist both in India and Africa;* but it is impossible to say whether these are of the original stock, or themselves sprung from individuals which at some former time have deserted into the woods, in a country where game abounds, and there shifting for themselves, become the ancestors of a numerous race. The young, we believe, require no pains to domesticate; and such is certainly the case as it respects the Pariah Dogs of India, a sort of half domesticated breed, (and half domesticated only because they have no stated owners,) which roam about the towns and villages, where they fulfil the office of scavengers, devouring the offal of the markets, and clearing the streets of refuse.

Dogs similar to the Pariah race are found universally throughout the east, Turkey, and the whole of the Levant, and appear to have continued there from the utmost antiquity. Tolerated for their public utility, and associating in packs, they scour the towns and villages, and often hover around the tents, subsisting on the putrid matter and dead animals, which in those countries lie exposed, and would prove an intolerable nuisance were it not for their services. In this duty the hyena, jackal, and vulture, also materially assist. To these circumstances we find numerous allusions in the works of the most ancient writers.† Homer, in

* The late Bishop Heber infoims us that, upon the authority of the Khausa peasants, near the frontiers of China, the tiger is often killed and torn to pieces by large packs of these dogs, which possess a very fine scent.

† In other places also Homer refers to this mutual work of *dogs* and *vultures*.

——— πολλȣς δε κυνες και γυπες εδονται
Τρωων. *Il.* xviii.

the opening lines of the Iliad, speaks of the dogs feasting upon the mighty slain—

> "Whose limbs, unburied on the naked shore,
> Devouring *dogs* and hungry *vultures* tore."
> POPE'S *Transl.*

Nor are the sacred scriptures silent. In Exodus xxii. 31, we find the following injunction: "neither shall ye eat any flesh that is torn of beasts in the field; ye shall *cast it to the dogs.*" In the prophetic denunciation against Ahab, 1 Kings xxi. 19, there is a still more forcible allusion: "In the place where the *dogs* licked the blood of Naboth, shall *dogs lick* thy blood, even thine;" and again, ver. 23, "The *dogs shall eat* Jezebel, by the wall of Jezreel;" a prophecy which was so fulfilled, that after she was killed (see 2 Kings ix.) those that went to bury her "found no more than the skull, the feet, and the palms of the hands," ver. 35. To the habits also of these masterless animals in traversing the streets to pick up the offal of the houses and markets, we find a clear allusion in Psalm lix. 6: "They return at evening; they make a noise *like a dog,* and go round about the city;" to which, ver. 15, it is added, "Let them *wander up and down for meat,* and grudge if they be not satisfied."

' In Ovid also we find a similar allusion:—

> Unguibus et rostro tardus trahet ilia vultur,
> Et scindent avidæ perfida corda canes.

Silius Italicus, speaking of the custom of some nations in exposing their dead, makes the same:—

> Tellure, ut perhibent, is mos antiquus Ibera
> Exanima obscœnis consumit corpora vultur.
> Regia cum lucem posuerunt membra probatum est
> Hyrcanis adhibere canes. *De Bell. Punic.* xiii.

In accordance with these facts is the graphic picture of a scene painted from observation during a residence in Greece and Turkey, by a late celebrated poet:—

> " He saw the lean dogs beneath the wall
> Hold o'er the dead their carnival,
> Gorging and growling o'er carcass and limb;
> They were too busy to bark at him:
> From a Tartar's skull they had stripp'd the flesh,
> As ye peel the fig when the fruit is fresh."
> &c. &c. *Siege of Corinth.*

It was probably owing to its habits and voracity that the Dog was declared unclean by the Jewish law, and held in aversion, so that the term *dog* was the most offensive appellation which could be used. It is a term often used in the scriptures as applicable to the vile and the abandoned; as, for example, in Philippians iii. 2, "Beware of *dogs*, beware of *evil workers;*" and in Rev. xxii. 15, " for without are *dogs* and sorcerers." In prophecy the Lord Jesus Christ says, "For dogs have compassed me: the assembly of the wicked have enclosed me: they pierced my hands and my feet." Psa. xxii. 16. This is a correct description of the cruel persecutions of Christ when he " bore our sins in his own body on the tree." Our Lord also used this epithet to try the faith and patience of the woman of Canaan, who petitioned him in behalf of her daughter, as well perhaps as to show the Jews, who despised the Canaanites, that he was no respecter of persons, but that he regarded the meek and lowly, those who are deeply and truly humbled by a sense of their own sinfulness and unworthiness, dogs as they

might seem in the eyes of the haughty Pharisee, and thereby reprove their want of sincerity and love. "But he answered and said, It is not meet to take the children's bread, and to cast it to *dogs*. And she said, Truth, Lord: yet the dogs eat of the crumbs which fall from their masters' table." Matt. xv. 26—7.

To return, however, to the original stock of this useful animal. It may savour perhaps of presumption in ourselves to hazard an opinion, but we are strongly inclined to think that when man "went out to till the ground from whence he was taken," the Dog was expressly given to him as his assistant and ally. Of all animals the Dog alone is identified with his master's interests and pursuits; the rest may be said rather to endure his dominion; but the Dog is one of his family, knows his looks, his voice, his walk, rejoices at his approach, solicits his notice, and defends his person. Homer, in the true spirit of nature and poetry, represents Ulysses after his ten years wanderings, as recognised alone, on his return to Ithaca, by his old and faithful dog, which died with joy at his feet.

So different indeed is the compact which binds the dog to man, from that which subsists between man and other animals, and so necessary are its services in preparing the way for civilization, in subduing the desert, and securing him the enjoyment of tranquillity, as to justify our opinion that this animal was never otherwise than the domestic servant of the human race. And if such be the case, it would only add another to the proofs of the goodness of God, in alleviating the sentence which doomed man to a life of

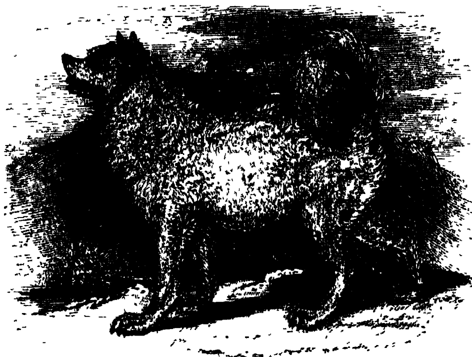
progressive labour, and to a state of advancement by his own efforts in the great work of civilization and refinement.

The utility of the Dog in the dawn of society, and in climes abounding with ferocious beasts, forced itself to the mind of one of our most celebrated travellers in Africa, Mr. Burchell, who draws a striking picture of an encampment during the night in a dreary wilderness, where the stillness of the solitude is only broken by the roar of the lion, and the howling of wolves and other beasts of prey, prowling in quest of food. Surrounded by his watchful and courageous dogs, while the men and guides who attended him were asleep, he felt how nearly his own life, and that of his men and oxen, depended upon the fidelity and attachment of these tried companions, who had been his fellow sharers in danger, toil, and hunger, and who were then keeping vigilant guard around him.

We deem it unnecessary to enter into the minutiæ concerning this animal, or into its different varieties, of which we shall only select one example, because it proves how much the very existence of the human race, under certain conditions, depends upon its services.

The Esquimaux Dog, *(Canis familiaris—*Var. *Borealis.)* This variety is characterized by a firm and muscular figure, thick furry hair, and bushy tail curled gracefully over the back. Its size is about that of a mastiff; its voice, at least in its native climate, is not a bark, but a long melancholy howl; when, however, it is brought over to England, and associates with

others of its kindred, it soon learns the usual accomplishment.

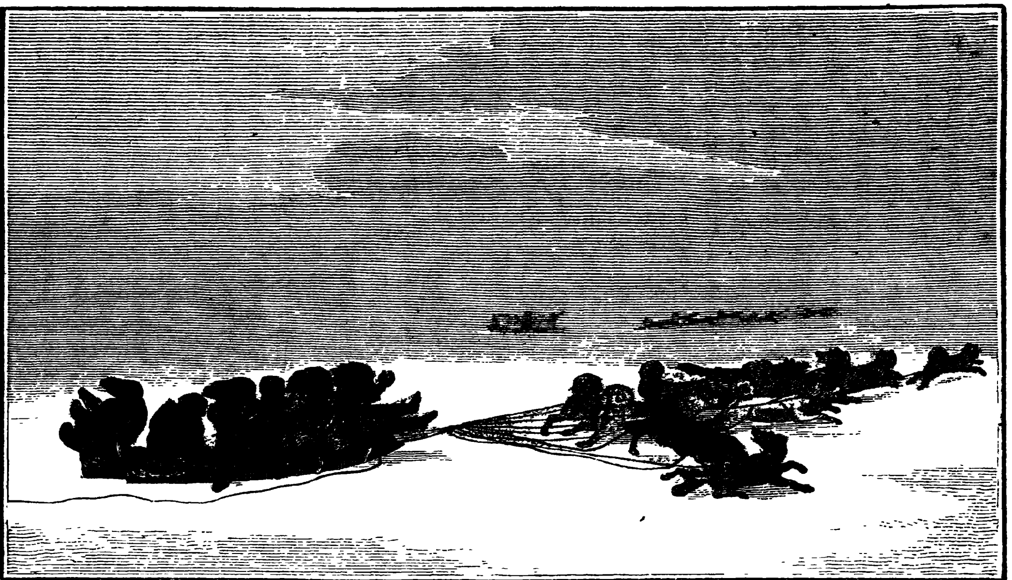


To give an idea of the services and utility of these Dogs, we must refer to the condition of the Esquimaux themselves. Fancy boundless deserts of snow, a winter of three-fourths of the year, and an intenseness of cold which description can scarcely convey: such is the country of the Esquimaux. They are a race inhabiting the arctic regions of the American continent and the adjacent islands; and their subsistence and clothing depend upon the produce of the chase. To their dogs they look for assistance in the pursuit of the seal, the bear, or the rein-deer; nor is this all: they yoke them to heavily-laden sledges, which with untiring patience these animals will often drag fifty or sixty miles a day. Yet their treatment is not the kindest; blows and scanty food are the reward of their labour. Undaunted in the combat, they will

fasten eagerly on the most ferocious bear, discover a seal-hole by the smell at a very great distance, and, even while yoked to a sledge in which the hunter is seated, chase the rein-deer with the utmost energy, so as to bring it within reach of his unerring arrow. Of the wolf, however, these dogs have an instinctive terror, which manifests itself on his approach in a loud and long continued howl. The following interesting passage is from Captain Parry's "Journal of a Second Voyage for the Discovery of a North-west Passage;" it is an admirable description of the manners of these singular people, and the utility of their dogs:—

"When drawing a sledge, the dogs have a simple harness *(annoo)* of deer or seal skin, going round the neck by one bight, and another for each of the fore-legs, with a single thong leading over the back, and attached to the sledge as a trace. Though they appear at first sight to be huddled together without regard to regularity, there is in fact considerable attention paid to their arrangement, particularly in the selection of a dog of peculiar spirit and sagacity, who is allowed by a longer trace to precede the rest as a leader, and to whom, in turning to the right or left, the driver usually addresses himself. This choice is made without regard to age or sex, and the rest of the dogs take precedency according to their training or sagacity, the least effective being put nearest the sledge. The leader is usually from eighteen to twenty feet from the fore part of the sledge, and the hindmost dog about half that distance, so that when ten or twelve are running together several are nearly abreast of each other. The driver sits quite low, on the fore part of the sledge, with his feet over-

hanging the snow on one side, and having in his hand a whip, of which the handle, made either of wood, bone, or whalebone, is eighteen inches, and the lash more than as many feet in length; the part of the thong next the handle is platted a little way down to stiffen it and give it a spring, on which much of its use depends; and that which composes the lash is chewed by the women, to make it flexible in frosty weather. The men acquire from their youth considerable expertness in the use of this whip, the lash of which is left to trail along the ground by the side of the sledge, and with which they can inflict a very severe blow on any dog at pleasure. Though the dogs are kept in training entirely by the fear of the whip, and indeed without it would soon have their own way, its immediate effect is always detrimental to the draught of the sledge, for not only does the individual that is struck draw back and slacken his trace, but generally turns upon his next neighbour, and this passing on to the next occasions a general divergency, accompanied by the usual yelping and showing of the teeth. The dogs then come together again by degrees, and the draught of the sledge is accelerated; but even at the best of times by this rude mode of draught, the traces of one-third of the dogs form an angle of thirty or forty degrees on each side of the direction in which the sledge is advancing. Another great inconvenience attending the Esquimaux method of putting the dogs to, besides that of not employing their strength to the best advantage, is the constant entanglement of the traces, by the dogs repeatedly doubling under from side to side to avoid the whip, so that after running a



SLEDGES DRAWN BY THE ESQUIMAUX DOGS.

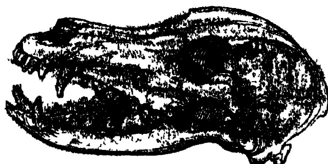
few miles the traces always require to be taken off and cleaned. In directing the sledge the whip acts no very essential part, the driver for this purpose using certain words, as the carters do with us, to make the dogs turn more to the right or left. To these a good leader attends with admirable precision, especially if his own name be repeated at the same time, looking behind over his shoulder with great earnestness as if listening to the directions of the driver. On a beaten track, or even where a single foot or sledge mark is occasionally discernible, there is not the slightest trouble in guiding the dogs, for even in the darkest night, and in the heaviest snow-drift, there is little or no danger of their losing the road, the leader keeping his nose near the ground and directing the rest with wonderful sagacity. Where, however, there is no beaten track, the best driver among them makes a very circuitous course, as all the Esquimaux roads plainly show; these generally occupying an extent of six miles, when with a horse and sledge the journey would scarcely have amounted to five. On rough ground, as among hummocks of ice, the sledge would be frequently overturned or altogether stopped, if the driver did not repeatedly get off, and, by lifting or drawing it to one side, steer clear of those accidents. At all times, indeed, except on a smooth and well made road, he is pretty constantly employed thus with his feet, which, together with his never-ceasing vociferations and frequent use of the whip, renders the driving of one of the vehicles by no means a pleasant or easy task. When the driver wishes to stop the sledge, he calls out, '*wo woa,*' exactly as our carters do; but the attention paid to

this command depends altogether on his ability to enforce it: if the weight is small, and the journey homeward, the dogs are not to be thus delayed; the driver is therefore obliged to dig his heels into the snow to obstruct their progress, and, having thus succeeded in stopping them, he stands up with one leg before the foremost cross-piece of the sledge, till, by means of laying the whip gently over each dog's head, he has made them all lie down; he then takes care not to quit his position, so that should the dogs set off he is thrown upon the sledge, instead of being left behind by them."

With "good sleighing," that is, on good roads, "six or seven dogs will draw from eight to ten hundred weight, at the rate of seven or eight miles an hour, for several hours together." With a smaller load they will run ten miles an hour, and are in fact almost unmanageable. To the women who nurse them when ill, and treat them with greater kindness than the men, they are affectionate in the highest degree. From the men they receive little except blows and rough treatment; still they are faithful and enduring.

Here our account of the Dog must end. Were we to follow our inclination, we should trespass too far upon our limits, and too far perhaps upon the patience of our readers. To sum up the whole, various as are the breeds, and fitted for various spheres of usefulness to man, still we see among them all the same pervading characters, the same intelligence, the same personal attachment, the same docility, and the same instincts.

Below we present our readers with a sketch of the SKULL OF A DOG, in order to illustrate the dentition of



the genus *canis*, including the dog, wolf, jackal, &c., and to explain the terms by which the teeth are scientifically defined. The teeth are thus distinguished:—

1. *Incisors:* these are the *cutting teeth*, small in this genus, pointed, and six in number above and below. They are succeeded, on each side, by a strong conical tooth, called,

2. The *Canine:* these teeth are large and strong in this genus and throughout the whole order. Next to the canine follow three teeth, on each side, in the upper jaw, and four teeth in the under, called,

3. The *False Molars:* they are small, and pointed in this genus, and behind them is a single large powerful tooth, called,

4. The *Carnivorous* or *Laniary Molar:* these, for there is one on each side above and below, indicate by their shape and scissor-like action upon each other the quality of the food. They are followed by two smaller tubercular teeth, barely visible in the drawing, called,

5. The *Tubercular Molars:* these, according to their approximation to the shape of the laniary molars,

indicate the nature of the diet. In the dog their blunt tuberculous character has a relation to the vegetable matter which this animal does not refuse.

The Wolf, *(Canis Lupus.)* This animal has been in every age the terror of the fold. Skulking, cowardly, savage, and voracious, he attacks every creature which he feels confident of being able to conquer; but seldom man, and then only when pressed by necessity. His proportions are larger, and his frame more muscular than the dog, between which and himself there exists the most inveterate hatred.

Wolves generally combine in packs, and hunt down their prey by the scent, or, forming a semicircle, advance upon it so as to force the unfortunate animal over a precipice, or by gradually hemming it in, prevent its escape.

In the narrative of Captain Franklin's Overland Journey, we find the following confirmation of our statement: "We passed the remains of two red deer at the bases of perpendicular cliffs, from the summits of which they had probably been forced by the wolves. These voracious creatures, who are inferior in speed to the moose or red deer, are said frequently to have recourse to this expedient in places where extensive plains are bounded by precipitous cliffs. Whilst the deer are quietly grazing, the wolves assemble in great numbers, and, forming a crescent, creep slowly towards the herd, so as not to alarm them much at first; but when they perceive that they have fairly hemmed in the unsuspecting creatures, and cut off their retreat

across the plain, they move more quickly, and with hideous yells terrify their prey and urge them to flight by the only open way which is towards the precipice, appearing to know that when the herd is once at full speed it is easily driven over the cliff, the rearmost urging on those that are before. The wolves then descend at their leisure and feast on the mangled carcases."

In this manner a pack of nine wolves advanced on Dr. Richardson, who, undaunted by the formidable array, passed boldy through them to the tents, while not one dared to begin the attack upon him.

We find the Wolf noticed in several passages of the holy scriptures, and always with an allusion to its cruel and savage disposition. The first instance is in Genesis xlix. 27, where Jacob prophesies respecting Benjamin, that he " shall ravin as a wolf; in the morning he shall devour the prey, and at night he shall divide the spoil."

In the New Testament false prophets are compared to this treacherous and crafty enemy: " Beware of false prophets, which come to you in sheeps' clothing, but inwardly they are ravening wolves." Matt. vii. 15. The one treacherously seizes the body and devours it; the others terrify and bewilder the soul, and drive it into error and perdition.

The Wolf still abounds in the colder and more mountainous parts of Europe, where the depredations it commits are frequently of the most serious character. In the government of Livonia, in Russia, alone, a district of two hundred and fifty miles long, and one

hundred and fifty broad, the following animals were destroyed by wolves in 1823. The account is official:

Horses	1,841	Goats	2,545
Fowls	1,243	Kids	183
Horned cattle . .	1,807	Swine	4,190
Calves	733	Sucking Pigs . .	312
Sheep	15,182	Dogs	703
Lambs	726	Geese	673

From the above statement we may form some idea of the condition of England when laws were made with a view to the destruction of this animal, retreats built in the northern districts to secure passengers from its attacks, and taxes paid in wolves' heads. At one period it was the plague and terror of our island. The month of January was called "*Wolf-monat*" by our Anglo-Saxon forefathers, "because people are wont in that moneth to be more in danger to be devoured of wolves than in any season els of the yeare, for that through the extremity of cold and snow those ravenous creatures could not find other beasts sufficient to feed upon." See Verstegan's "Restitution of decayed Intelligence in Antiquities concerning the most noble and renowned English Nation." Antwerp, 1605.

Numerous wild and superstitious legends connected with this animal, and arising from the terror it has inspired, have prevailed in all ages. The Greeks had their *Lycanthropus*, or man-wolf, a sort of fiendish sorcerer; the Anglo-Saxons their *were-wolf*, a being who could assume the form and nature of the wolf at pleasure, delighting in human flesh and deeds of horrid cruelty. In Germany the same superstition prevailed, and also in France, where the *Loup-garou* was the

terror of the peasant. The whole may be referred to a dread of the animal, whose ferocious and sanguinary habits were matters of common experience.

Hence also kings and chiefs in barbarous ages have adopted its name, or been recognised by it either in consequence of their ravages, or from a wish to appear doubly formidable. The Saxon names of note bearing this affix are very numerous: thus Æthelwolf, or noble wolf; Berthwolf, illustrious wolf; Eadwolf, prosperous wolf, &c. A better spirit now reigns; man, humanized by the doctrines of christianity, no longer rejoices in a name associated with rapine and slaughter, and which he would naturally feel incited to substantiate in order to keep up his authority and power, but is taught to consider mildness, justice, and temperance, as more honourable characteristics, and the love of his fellow-men, and the acceptance of his services before God, as more truly ennobling than all the renown which bloody deeds can purchase.

Notwithstanding the endeavours to exterminate the Wolf in England, it maintained its ground for many centuries, and then lingered for a still longer period in the highlands of Scotland. In Ireland its extermination was effected about the beginning of the last century. In the northern countries of Europe it is still extremely abundant, and some have been killed measuring six feet from the muzzle to the end of the tail. The Wolf never carries the tail curled upwards; his pace is characterized by a sort of "dogged indecision;" the fur is thick, coarse, and of a yellowish grey, more or less inclining to a darker hue: when pressed by hunger, he will devour every sort of offal, attack man

and every animal with ferocious obstinacy, and even disinter the dead from their graves.

> " By wintry famine roused from all the tract
> Of horrid mountains, which the shining Alps,
> And wavy Apennine, and Pyrenees
> Branch out stupendous into distant lands ;
> Cruel as death, and hungry as the grave,
> Burning for blood, bony, and gaunt, and grim,
> Assembling Wolves in raging troops descend;
> And pouring o'er the country, bear along
> Keen as the north wind sweeps the glossy snow :
> All is their prize. They fasten on the steed,
> Press him to earth, and pierce his mighty heart ;
> Nor can the bull his awful front defend,
> Or shake the murdering savages away ;
> Rapacious at the mother's throat they fly,
> And tear the screaming infant from her breast.
> * * * * * * * *
> * * * * * * * *
> But if apprized of the severe attack,
> The country be shut up, lured by the scent
> Of churchyards drear, (inhuman to relate !)
> The disappointed prowlers fall and dig
> The shrouded body from the grave."
>
> THOMSON'S WINTER.

" In the commencement of the reign of Louis XIV. in the depth of winter and of the snows, a large party of dragoons were attacked near Pontharlier, at the foot of the mountains of Jurat, by a multitude of wolves. The dragoons fought bravely, and killed many hundreds of them; but at last, overpowered by numbers, they and their horses were all devoured. A cross is erected on the place of combat, with an inscription in commemoration of it, which is to be seen at this day." —*Captain Brown's Biographical Sketches.*

This may have suggested the lively description of

the dangers incurred by Crusoe and his party among the Pyrenees from the same cause, which has so often interested while it horrified us in our younger days.

Mr. Lloyd, in his "Field Sports in the North" of Europe, relates many interesting anecdotes of hair-breadth escapes from this ferocious animal, and every reliance may be placed on their authenticity. We select the following; the circumstances occurred a few years ago in Russia:—"A woman, accompanied by three of her children, was one day in a sledge, when they were pursued by a number of wolves. On this she put the horse to a gallop and drove towards her home, from which she was not far distant, with the utmost possible speed. All, however, would not avail, for the ferocious animals gained upon her, and at last were on the point of rushing on the sledge. For the preservation of her own life, and that of the remaining children, the poor frantic creature now took one of her babes and cast it a prey to her bloodthirsty pursuers. This stopped their career for a moment; but, after devouring the little innocent, they renewed the pursuit, and a second time came up with the vehicle. The mother, driven to desperation, resorted to the same horrible expedient, and threw her ferocious assailants another of her off-spring. To cut short this sad story, a third child was sacrificed in a similar manner. Soon after this, the wretched being, whose feelings may be more easily conceived than described, reached her home in safety. Here she related what had happened, and endeavoured to palliate her own conduct by describing the dreadful alternative to which she had been reduced. A peasant, however, who was among the bystanders, and heard

the recital, took up an axe, and with one blow cleft her skull in two, saying, at the same time, that a mother who could thus sacrifice her children for the preservation of her own life was no longer fit to live. This man was committed to prison, but the emperor subsequently gave him a pardon."

The JACKAL, (*Canis aureus.*) The Jackal is in all



probability the fox (or shual) of the sacred writers, and it still abounds throughout the Levant, Syria, and the whole of the eastern world, and in Africa from Barbary to the Cape of Good Hope; it hunts in troops or packs, pursuing the antelope and other animals for its prey, as well as contributing its services to clear the country and suburbs of towns and villages of carrion in every stage of putrefaction. This animal has been called the lion's provider, and is popularly supposed to hunt down the quarry for this royal beast: such a story is, however, destitute of foundation; at

least, if there be any ground for the opinion, it is simply this, that when the cry of the Jackal is heard, the lion, aware of the cause, makes his appearance, and seizes without any ceremony on the booty. Most travellers agree in the terrific effect which the cry or rather shriek of this animal produces, resounding during the stilly darkness of the night, and reanswered from a hundred throats. "The cry of the Jackal," says Captain Beechey, "has something in it rather appalling when heard for the first time at night; and as they usually come in packs, the first shriek which is uttered is the signal for a general chorus;"—"the sudden burst of the answering long-protracted scream, succeeding immediately to the opening note, is scarcely less impressive than the roll of the thunder-clap immediately after a flash of lightning." The passages in the scriptures, where the name of this animal (shual) occurs, describe with sufficient clearness its manners, and leave no doubt of its identity. The true fox is recluse and solitary, never associates in packs nor hunts down its prey, but always takes it by surprise; besides, it is very scarce in the east. Taking it for granted, then, that the Jackal is the animal intended, the first notice we find of it is where it is related of Samson, Judges xv. 4, that "he went and caught three hundred foxes (shual) and took firebrands," and tied the firebrands to them, for the purpose of burning the cornfields of the Philistines. In Lam. v. 18, Jeremiah beautifully strengthens the picture of the desolation of the mountain of Zion, by adding, "the *foxes* walk upon it." It is so deserted that the Jackals make it their unmolested abode.

This animal lives in holes or burrows of its own excavating, frequenting solitary places and the desolate ruins of towns or villages, where it abounds in great numbers. To its habits in this respect our Saviour refers in that touching declaration, "The *foxes* have *holes*, and the birds of the air nests; but the Son of man hath not where to lay his head." Matt. viii. 20. He who created all things by his mighty power, lacked, while in the days of his humiliation on earth, for our sake, that shelter which the Jackals found among the mountains of Judea; there they lived in concert together; there they found a safe retreat; but He was alone, encountering reproach and persecution; He had no friendly shelter to cover him from the storm, no hospitable roof to receive him with greetings and welcome. He could look around, and see all besides provided for; even the Jackal had its hole, but He not where to lay his head. Thus even in life, and still more in the bitter pains of his dying sufferings, "Surely he hath borne our griefs and carried our sorrows."

The size of the Jackal is that of our common fox; its skin exhales a strong and offensive odour; the pupils of the eyes are round; the ears pointed; the tail bushy, reaching only to the heel, and black at its extremity; the upper part of the body is a dirty yellow, a darker mark running along the back and sides; the under parts yellowish white.

Besides the present species, there are several closely allied to it; among which we may mention the Adive, (*Canis corsac,*) a small animal not larger than

a polecat, with a long tail, inhabiting in troops the deserts of Tartary; the CAPE JACKAL, *(Mesomela,)* of South Africa; the ANTHUS, *(C. anthus,)* of Senegal, &c.; all agreeing in manners and general disposition.

Passing from the jackal, we arrive at the true Foxes, distinguished at once by a linear or narrow pupil, and habits decidedly nocturnal, the full light of day being extremely oppressive to it. Of the COMMON FOX, *(Canis vulpes,)* the terror of the farm-yard from its voracity, and the favourite object of the chase in England, where packs of hounds are kept at a great expense solely for the pleasure of hunting it, we need say nothing. With slight variation in size and strength, it is common throughout Europe generally. North America produces several allied species, whose rich and beautiful fur is highly prized. The fur of the *Black* or *Silver Fox* is the most valuable in the world; but the animal is so rare, "that a greater number than four or five are seldom taken in a season at any one post in the fur countries." Its colour is a deep black, the long hairs all terminating in white, which produces a singular and beautiful effect, whence the title "*silvery.*" The ARCTIC FOX of the polar regions, *(Canis lagopus,)* may be likewise noticed, covered with white woolly fur. There is, however, one species, which, from its great rarity, may claim a short account, as well as from its being of much interest in a scientific point of view: it is the Fennec Fox of Bruce; a preserved specimen and skeleton of which are in the Museum of the Zoological Society.

The FENNEC, *(Canis fennicus.)* This curious animal



appears to have been first noticed by the celebrated traveller Bruce, who discovered it in his endeavours to penetrate to the source of the Nile. It is much smaller than the common fox, slightly made, with long and slender legs, and large and spreading ears, which impart a peculiar aspect to its physiognomy. Its colour is a uniform pale fawn, becoming lighter on the under parts. It is said to live in holes and burrows, and to climb trees, a circumstance which, if correct, is very remarkable. Its fur is short and silky, and its tail somewhat bushy. No little dispute has existed as to its true situation in nature; those who have examined its skeleton and the character of its teeth will not, we think, hesitate to place it among the foxes. Its history is as yet very imperfect.

The next group which presents itself, is that of the *Viverræ,* in which, besides the true genus Viverra, or

Civets, will be found several others closely united together. Of these we shall give as full a sketch as our limits allow. The general characters of the group are as follow:—Above are three false molars, and two large tubercular teeth; below, four false molars, and a single tuberculous tooth, on each side: the laniary molars are *tricuspid* (three-pointed) above, and *biscuspid* (two-pointed) below: the tongue is covered with stiff sharp papillæ; the head is narrow, the muzzle acute; the nostrils are pierced on the sides of the nose; the pupils of the eyes capable of contracting almost to a line; toes five, armed with claws semiretractile.

The first genus Viverra contains the CIVET, *(Viverra Civetta)*, celebrated for its musky perfume, the product of a peculiar glandular apparatus, and formerly in much repute, and an article of considerable commerce, being imported into Europe by way of Alexandria and Venice. At Enfras, a town in Abyssinia, great multitudes were kept for the purpose of supplying the markets; and Buffon states, that a similar practice prevailed also in Holland. The Civet is a native of the hottest parts of Africa; its habits are nocturnal, and its food consists of eggs, birds, small mammalia, and reptiles. In length it is nearly two feet and a half; the tail is about a foot; its height about the same; its fur is long, and composed of coarse silky hairs, forming a sort of mane along the back.* The ground-colour is gray, with dark transverse narrow stripes, which are largest on the body; four or five dark rings encircle the tail, which is black at its extremity, as is the muzzle also, with the exception of

the under lip, which is white. Like all nocturnal animals, it is torpid or indolent during the day, nor does it ever display much of either intelligence or docility.

Connected with the Civet, (if indeed it be not the same species,) but differing in the arrangement of its markings, is the ZIBETH, (*Viverra Zibetha.*) It is a native of India, and equally distinguished for its musky perfume.

The next genus is that of the GENETS, (*Genetta,*) in which we perceive a general similarity to the former in habits and manners, but a contour of body more like that of the weasels. The Genets are distinguished by their slender elongated figure, short limbs, and sharp-pointed muzzle; they are nocturnal in their habits, and prey upon eggs and small animals. The species are several; but we need only notice, as an example, the COMMON GENET, (*Genetta vulgaris.*) The Genet is a native of Syria, the Levant, and Africa, preferring low grounds, and delighting in the neighbourhood of streams and rivers, especially near their source. It is a beautiful animal, cleanly, lively, and active, and is often kept in a state of domestication at Constantinople to destroy various animals, as rats, lizards, snakes, &c. which infest houses in a warm climate. Its perfume is much fainter than that of the civet; its fur is soft and smooth, and very valuable as an article of commerce; the colour is gray, spotted with marks of black or brown, varying in size and number in different individuals. The muzzle is black; the tail as long as the body, and ringed with black; a

small mane runs down the back. Owing to the shortness of the legs, its height does not exceed five or six inches; the length of the body is about one foot.

Allied to this tribe is a singular animal called the *Pougouné*, or PARADOXURE GENET, (*Paradoxurus typus;*) the characters of which indicate it as forming the *type* or *exemplar* of a distinct and separate genus. Its habits and manners are those of the Viverræ in general; it, however, exhales no scent; and differs also in having the tail singularly twisted up in a spiral manner: it is the pretended "Genette de France" of Buffon.

As our limits allow us to notice only the *leading genera*, we shall conclude this section with some account of a very interesting animal of the genus *Herpestes*, namely, the celebrated ICHNEUMON of Egypt, (*Herpestes Pharaonis.*) The genus Herpestes includes



many species from Africa, and also from India and its Archipelago, generally known under the name of

Mangouste. The present species is, however, peculiar to Egypt and the adjacent country, where, from the benefits it confers, it was placed in ancient days among the most sacred animals of the Egyptian mythology. These benefits result from its instinctive propensity to attack every species of reptile, not only for food, but also for the very sake of slaughter. In a country subject to the periodical overflow of a river proverbially prolific, and at all times flowing through a low humid tract of mud, covered with reeds and flags, upon which a burning atmosphere is perpetually acting, a strong hold is formed for the propagation of various reptiles; and in Egypt they accordingly abound in fearful multitudes, and of terrific forms. The sudden and immense increase of certain of these noxious animals, by the miraculous interposition of the Almighty, constituted some of the plagues with which that country was so awfully afflicted, when an unjust Pharaoh would not let the children of Israel go, but hardened his heart against Jehovah.

To check an evil of so intolerable a nature is of very great importance; and in this service the Ichneumon acts a distinguished part. Not that it ventures to attack the larger kinds of serpents or crocodiles of even moderate size, but it does even better; it proceeds in a *wholesale way*, destroying their eggs by thousands, the recently hatched young, and all the smaller kinds without discrimination. Urged by this spirit of destruction, the Ichneumon sets out upon its rambles in the evening, silently stealing along with the utmost vigilance and caution. It examines every lurking-place, and peeps into every crevice or recess, alive at

once to its own danger and intent upon its prey; nor does it cease after its appetite is satisfied, but still continues its warfare of slaughter to the delight of the patronizing natives. From the ease with which it is domesticated, and from its docile and affectionate manners, it is commonly kept tame in houses, for the purpose of dislodging reptiles and various unpleasant intruders which in hot countries are frequent and sometimes fatal visitors. In this service it engages with the utmost zeal, prying into every hole and corner, or patiently keeping on the watch for hours together.

The Ichneumon is peculiarly graceful and easy in its movements, and endowed with surprising agility; when irritated, or about to spring on its prey, its eyes become vivid, its hair erect, and its whole aspect betrays great eagerness and ferocity. The fur of this beautiful little animal is of a uniform silvery gray, the tip of the tail being black; but each hair of the body, if examined separately, will be found ringed with white, dark, and fawn colour; its eyes are red, small, and sparkling; its voice soft and murmuring; it often sits up like a squirrel in feeding. Its Coptic name in Egypt is *Nems;* its name in the Arabic dialect, of the northern coast of Africa, *Serro.* In size it is something larger than a cat; its stature being about eight inches, and its figure is long in proportion to its height.

The GRAY ICHNEUMON of India, or Mongouste, is somewhat smaller, but closely resembles the Egyptian in habits and disposition. It is very beautiful, and be-

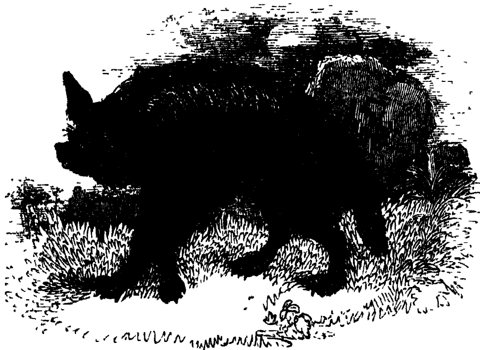
comes equally gentle and domesticated. It is reported to use a certain plant, the "*ophiorhiza mungos*," as a remedy against the envemoned bite of serpents, which it is celebrated for encountering, and that the knowledge of the virtue of this as an antidote has become known in consequence.

Dr. Horsfield describes another species of Ichneumon, from Java, where it is known by the name of GARANGAN. It abounds in the teak forests, and destroys snakes with singular address, for which it is much admired by the natives. When the reptile attacked involves this animal in its folds, the *Garangan* inflates its body to the utmost, and rapidly contracting, as the snake is about to bite, slips through its twining length, and, seizing it by the neck, puts an instantaneous finish to the combat.

Another subdivision of the Digitigrades now presents itself, containing but few species, perhaps not more than three, which form but one genus under the well known title *Hyæna*. The Hyænas are characterized by their large broad head, thick abrupt muzzle, and enormous power of the jaws, in which no carnivorous animal of their size at all approaches them: their teeth are very large and strong, especially the canine teeth and the laniary molars, which latter have three cutting edges on the outside, and a small tubercle within. The ears are large and erect; the nails nonretractile.

The three species known are the STRIPED HYÆNA, (*H. vulgaris;*) the VILLOUS, (*H. villosa;*) and the SPOTTED HYÆNA, or Tiger-wolf of the Cape, (*H. cro-*

cuta.) Though agreeing in general manners, they appear to inhabit different countries, the common Hyæna being found from Persia through India, and along the north of Africa to Abyssinia and Senegal; the Villose and Spotted appearing to be exclusively confined to the more southern portions of the African continent. Our chief attention will be directed to the STRIPED HYÆNA, as being the most universally spread, and a fair representative of the race.



The writings of the Greek and Roman naturalists furnish abundant proofs of the acquaintance of the ancients with this celebrated animal, but also evince that their knowledge was mixed up with the belief of many absurdities which have been too currently received. Few animals have been placed in a more odious light, few more misrepresented; and Credulity has re-echoed the words of Superstition. It will be worth a little trouble to set the character of this animal

in its true light. The Hyæna is certainly a formidable enemy, yet it seldom or never voluntarily attacks man, avoiding rather than courting an encounter, but defending itself with determined obstinacy. Contrary to common prejudice, and startling as it may seem, no wild animal is more easily tamed, or exhibits more affection: in this respect it closely approaches the dog; and Cuvier observes, that, in a domestic state, it would "doubtless render to man services of the same kind and degree as the canine species." In fact, Barrow informs us, in the account of his travels in the Cape, that the Spotted Hyæna has been "lately domesticated in the district of Schneuburg, where it is considered one of the best hunters after game, and as faithful and diligent as any of the common sorts of domestic dogs." To this we may add, that the late Bishop Heber saw in India a Hyæna, the property of a Mr. Traill, which followed that gentleman about like a dog, and fawned on those with whom it was acquainted.

To the gentleness of the Hyæna the writer can add his own testimony; those, therefore, wrong it who describe it as untameable. In its wild state, of course, when every one's hand is against it, the better traits of its disposition can never be developed; but when taken young, it may be brought up in the same manner as a dog, and, like that animal, instead of being the terror of the herd, learn to become their defender.

The Hyæna feeds principally at night, and conceals himself during the day in his den, among ruins, craggy rocks, or solitary thickets. As evening draws in, these animals begin their prowl, haunting the streets of

villages and towns, where they devour the offal, not refusing the hardest bones, which they crush into small fragments with their powerful jaws; in this work of clearing the streets, they are joined by the vulture, between which and themselves there seems to exist a league of amity. The Hyæna does not, however, confine his visits to towns and villages, nor his food to the offal there. He also roams round the country in packs in search of living prey. The ass is his favourite food; but cattle of all descriptions are ravenously destroyed.

Major Denham, after relating the shocking circumstance of a poor female slave, while returning home from weeding the corn, to Kowa (about ten miles from Kouka) being carried off by a lioness, proceeds to narrate the depredations of the hyænas. "These," says he, "are every where in *legions*, and grew now so extremely ravenous, that a good large village, where I sometimes procured a draught of sour milk on my duck-shooting excursions, had been attacked the night before my last visit, the town absolutely carried by storm notwithstanding defences of nearly six feet high of branches of the *prickly trilloh*, and two donkeys, whose flesh these animals are particularly fond of, carried off in spite of the efforts of the people. We constantly heard them close to the walls of our town at night; and on a gate being left partly open, they would enter and carry off any unfortunate animal they could find in the streets." In another part the same lamented traveller tells us, "The hyænas came so close to the tents last night, that a camel, which lay about a hundred yards from the enclosure, was found nearly half

eaten. A lion first made a meal on the poor animal, when the hyænas came down upon what he had left." During the ruthless wars which take place among the barbarous nations of Africa, hyænas and vultures are regular attendants upon the field of battle; the dead are left unburied, the vultures gorge their fill; the hyænas complete the work, so as scarcely to leave a bone to attest the slaughter.

Bruce, the Abyssinian traveller, had many encounters with these animals. "They were," says he, "the scourge of Abyssinia in every situation both of the city and the field; and they seemed to surpass even the sheep in number. From evening till the dawn of day the town of Gondar was full of them: here they sought the different pieces of slaughtered carcasses which were exposed in the streets without burial. Many a time in the night when the king had kept me late in the palace, on going across the square from the king's house, I have been apprehensive lest they should bite me in the leg. They grunted in great numbers around me, although I was surrounded with several armed men, who seldom passed a night without wounding or slaughtering some of them. One night I went out of my tent, and returning immediately I perceived two large blue eyes glaring at me in the dark. I called my servant to bring a light, and we found a hyæna standing near the head of the bed with two or three large bunches of candles in his mouth, by keeping which he seemed to wish at that time no other prey. I was not afraid of him, and with a pike struck him as near the heart as I could. It was not until I had done this that he showed any signs of fierceness;

but, upon feeling his wound, he dropped the candles, and endeavoured to run upon the shaft of the spear to arrive at me, so that I was obliged to draw a pistol from my girdle and shoot him, and nearly at the same time my servant cleft his skull with a battle-axe. In a word the hyænas were the plague of our lives, the terror of our night walks, and the destruction of our mules and asses, which are their favourite food."

Along the northern line of the African coast, where abundant ruins testify of "cities long gone by," the Hyæna peoples the solitary relics of human dwellings. It must be a striking and an affecting thing to pass through these crumbling memorials of nations once flourishing; streets once thronged by the busy, the gay, and the thoughtless; halls, whose echoes once responded to the song and the voice of laughter; walls of temples, where idols usurped the place of the living God, and find all dreary, silent, desolate; the only tenants being beasts of darkness, the yelling jackal and the sullen hyæna. How true is it that the proudest works of man are evanescent! Vanity is written on all. History is itself a tale of successive desolations; cities, nations, empires, perish; "but the word of the Lord endureth for ever."

The size of the Hyæna is that of a large mastiff; but the head and neck are of great thickness, and possess tremendous strength. In combat he fears no animal, and will resist the lion himself. His coat consists of long harsh hairs, which form a mane running down the back from the shoulders; the colour is a dirty gray clouded with transverse stripes of a darker tint. The Hyæna stands higher before than at his hind

quarters; his hind legs, indeed, seemed bowed and disproportionally weak; hence his walk is a shuffling awkward pace; nevertheless, he can run with great celerity. The developement of muscular power, concentered in the fore parts, affords an indication, in accordance with other features, of the propensities and habits. The Hyæna, like the dog, is impatient of confinement; this and ill usage combine to break his temper, and render him distrustful and savage.

The next genus is that which contains the most formidable of the Mammalia. To an appetite for carnage possessed by all, the leading species add size and powers which render them doubly dangerous. The genus is that of *Felis,* or the *cat tribe,* and includes the lion, the tiger, the leopard, and many others differing principally in size and strength, all being cunning and sanguinary. The characters are these:—Teeth strong and acute; the incisors six above, and six below; the canine of great length and thickness; the laniary molars with three lobes; the head is strong and rounded; the ears are short; the pupils of the eyes circular in some, in others oval; the toes five on the fore limbs, and four on the hind, armed with hooked retractile talons.

The first and most striking animal of this tribe is the LION, *(Felis Leo.)* From the earliest periods of antiquity to the present day this terrific beast has held a sort of ascendancy over the mind of man, to which his noble presence, gigantic bodily powers, and undaunted resolution have contributed. His haughty

growl, his short sharp roar of anger, the steady and fixed gaze of his terribly expressive eye, the freedom and firmness of his step, proclaim him the monarch of his race.

The Lion is nocturnal in his habits, slumbering in his lair during the day, but rousing up, as the sun descends below the horizon, to prowl about for prey. Like the rest of the cat tribe, he seldom makes an open attack, but places himself in ambush, or creeps along silently till within reach of his victim, and then a bound, a roar, a blow, and all is over.

During the nocturnal tempests of lightning and rain, which are common in Africa, the roar of the Lion adds to the wild terrors of the gloomy scene; such are his favourite nights; the conflict of the elements, while it makes no impression on him, throws more timid animals into confusion, and renders them less sensible of his approach; he then, says Mr. Burchell, "appears to advance upon them with less caution." Of his audacity, when thus favoured by the night, the same traveller had frequent experience. "While all of us were lying in the wagons, the dogs commenced a barking and howling; the whole of the oxen suddenly made efforts to get loose, and began to express that kind of uneasiness which in a very intelligible manner told us that a lion was not far off; he continued prowling round us till midnight, but his fears to encounter men were the only obstacle to prevent his carrying off his prey; and finding it thus too strongly protected, he at last withdrew." Darkness, torrents of rain, flashes of lightning, and the lion prowling around a slight enclosure, compose a picture for an artist's study.

The Lion's strength is so great that he is capable of carrying off a "horse, a heifer, or a buffalo." Those who have only seen him as he is in captivity, shut up in a den scarcely twice his length, with his limbs unbraced by exercise, have seen only the shadow of that animal which "clears the desert with his rolling eye." Notwithstanding the ferocity of the Lion, travellers have not unfrequently passed him with impunity. An occurrence of this kind happened to the celebrated Mungo Park; but it was during the day: the animal was reposing at his ease, and most probably had satiated his appetite the preceding night.

Mr. Burchell describes with great spirit several interesting encounters with the Lion. We take the liberty of extracting the following account of an affray on the banks of a river abounding in tall mat-rushes; it is highly characteristic:—"The dogs seemed much to enjoy prowling about and examining every bushy place, and at last met with some object among the rushes, which caused them to set up a most determined and vehement barking. We explored the spot with caution, as we suspected from the peculiar tone of their bark that it was, what it proved to be, lions." The dogs being encouraged drove out an enormous lion and lioness; but the latter escaped, by taking advantage of the covert of the tall rushes: not so the lion, he "came steadily forward, and stood still to look at us. At this moment we felt our situation not free from danger, as the animal seemed preparing to spring upon us, and we were standing on the bank at the distance of only a few yards from him; most of us being on foot, unarmed, without any visible opportunity of escaping. I was on foot myself, and it was

useless to attempt avoiding him. I stood well upon my guard holding my pistols in my hand, with my finger upon the trigger; and those who had muskets kept themselves similarly prepared. At this instant the dogs flew boldly in between us and the lion, and, surrounding him, kept him at bay by their resolute barking. The courage of these faithful animals was most admirable: they advanced up to the side of the huge beast, and stood making the greatest clamour in his face, without the least appearance of fear. The lion, conscious of his strength, remained unmoved at their noisy attempts, and kept his head turned towards us. At one moment, the dogs perceiving his eye thus engaged, had advanced close to his feet, and seemed as if they would actually seize hold of him; but they paid dearly for their imprudence, for without discomposing the majestic and steady attitude in which he stood fixed, he merely moved his paw, and at the next instant I beheld two dogs lying dead. In doing this he made so little exertion, that it was scarcely perceptible by what means they had been killed. Of the time which we had gained by the interference of the dogs not a moment was lost; we fired upon him; one of the balls went through his side just below the short ribs, and the blood immediately began to flow. We had no doubt that he would spring upon us; every gun was instantly reloaded; but he moved quietly away; though I had hoped in a few minutes to have been able to take hold of his paw without danger. This was considered by our party to be a lion of the largest size, and seemed, as I measured him by comparison with the dogs, to be, though less bulky, as large as an ox: he was certainly as long in the body,

though lower in stature; and his copious mane gave him a truly formidable appearance." ..... "Of the courage of the Lion I have no very high opinion; but of his majestic air and movement, as exhibited by this animal while at liberty in his native plains, I can bear testimony. Notwithstanding the pain of a wound, of which he soon afterwards must have died, he moved slowly away with a stately measured step."

Mr. Burchell is, we think, unfairly prejudiced against the Lion, which he considers as destitute of courage, because, having experienced the fatal effects of fire-arms, he is unwilling to risk a contest with powers, against which he has no means of effectual resistance. Mr. B. would think it very hard to be accused of cowardice for shrinking unarmed from a child who should present a loaded musket at his breast.

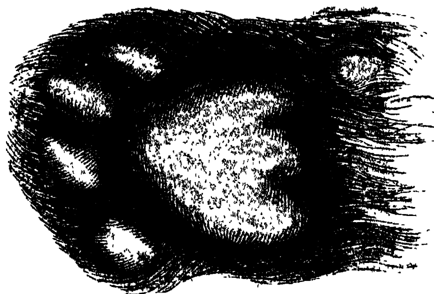
The Lion is one of those animals to which we find abundant allusions in the holy scriptures. These allusions regard two characteristics of his nature; on the one hand, his energy, power, and majesty; on the other, that ferocious and sanguinary disposition of which he partakes in common with the feline race in general. In Gen. xlix. 9, Jacob prophesies of his son Judah as standing for a future nation, that he shall resemble this animal; a prophecy which, in the first place, regards the nation of the Jews under the immediate governance of the Almighty, who raised them to the highest pitch of glory in the days of Solomon; and at the same time looks onward through a long vista of years to the promised Messiah, in whom all the nations should be blessed. The Lord Jesus Christ, as "the Lion of the tribe of Judah," Rev. v. 5, is terrible to

his enemies, and full of majesty and glory. Those who trust in him shall find that his Divine power is employed for their protection, and none shall prevail against him.

In an opposite point of view, we find the wicked, the unrighteous, and even the various evils and difficulties "of the way," compared to this animal. In the First Epistle of Peter, v. 8, Satan is compared to a roaring lion seeking whom he may devour, roaming about intent upon his prey; then woe to the unwary.

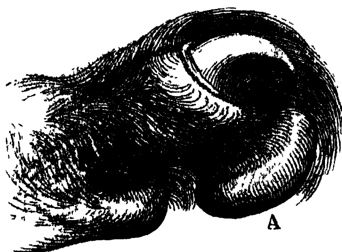
It is time, however, that we pass on to consider some of the mechanical contrivances in the structure of the organs of this animal, which display the most admirable design and skill. The bones of the fore limbs of the Lion are remarkable for their strength and firmness, and the muscles for their denseness and extraordinary developement; nor are those of the jaws and neck less powerful. On stripping the skin from these parts, we have one of the finest displays of the "beau ideal" of muscular developement which it is possible to conceive. The tongue is rough, with horny papillæ, the sense of taste being probably somewhat dull. The hearing is highly acute; and the sight adapted for nocturnal vision. But it is in the mechanism of the paws that we are presented with a most elaborate piece of work. Let it be borne in mind that the Lion, as we have said, creeps *silently* towards his prey, and then bounds upon it with a spring of *twenty* or *thirty feet*, bearing it to the earth with the irresistible impetus. Now, if we take one of the fore paws and examine it, we find it *softly cushioned* below, no formidable *talon visible*, and the whole mass *heavy* but *sinewy* and

flexible. That a sinewy and flexible structure with great strength is needed by an animal which bounds upon its prey, and whose habits require a free and active foot, is at once apparent; but why, in addition, is the sole padded with a soft springy cushion of granular fat, two inches in thickness, with a similar but smaller one on the base of each toe? The design of these springy pads, (represented in the accompanying sketch, which we have taken expressly for the purpose,) is twofold.

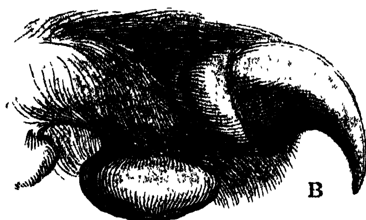


First, to render the tread so noiseless, that no foot-fall may alarm the quick-eared prey; and secondly, that the jar or concussion produced by the violence of the bound may be broken, so that neither the shoulder nor spine shall receive a shock from the forcible descent of so heavy a body propelled by powers so amazing. And why are not the talons visible? These are drawn back into sheaths, so that the point of each only just peeps out, but hid beneath the fur, and elevated far above the ground by the pulpy pad below,

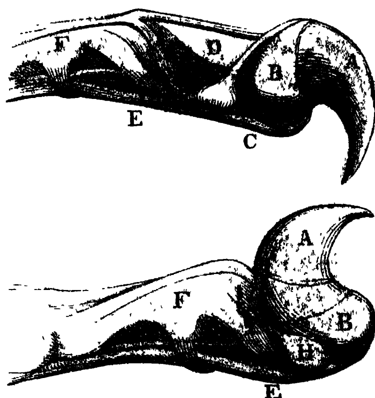
in order that they may be unworn and unblunted, so as ever to be ready for service: by a curious contrivance they can be sheathed and unsheathed at pleasure. Thus the Lion at play with his cubs or mate, uses an unarmed paw in his gambols, and only throws out these formidable weapons when he strikes in anger. By a single blow he can rip up the side of a horse or buffalo. Our annexed sketch represents one



of the toes, A, with the claw sheathed, the hair being a little thrown back so as to leave the point visible, which would otherwise be quite covered; the same toe, B, with the claw unsheathed, as in the act of striking, is given below.



To understand the mechanical contrivance of these claws we must refer to the following sketches.



The talon, A, terminates the bone, B, which forms the last joint of the toe; and this bone is fixed to its succeeding by a rolling hinge-like joint at the point, C, on which it freely moves; when drawn back, so as to be sheathed, the claw, in consequence of the mechanism of the joint, and the adapted shape of the succeeding bone, D, passes down by the outer side of that bone, without leaning upon it, so as to be allowed a more ample sweep of retraction. The claw is unsheathed by the action of the muscles of the fore arm, on a large and powerful flexor tendon, E, running beneath the toe, and braced tightly at the third bone, F; this tendon is inserted into the anterior part of the base of the bone, B; to which it forms the office of a pulley acting on a semirevolving hinge. In the very action of

striking with violence, the moving power or muscles attached to this pulley contract, and, tightening it, throw out the claws; when this action ceases, they return into their sheath again, and that without any voluntary effort, by means of elastic ligaments or *back-springs*, one of which is seen in the top sketch, page 201, leading from the top of the claw to a small bone, H, at the left of B, connected with the joint; aided by tendons, one of which may be observed passing along the upper surface of the toe to be inserted at the root of the claw. Such is the mechanism of the Lion's paw; nothing can be more simple, yet nothing more exquisite.

The Lion, though now limited, as it regards the countries over which it is spread, was once common in Syria and the adjacent country, as well as in the mountains of Thrace and Macedonia; but with the increase of human population and the progress of civilization it became driven back more and more from the haunts of man, and appears indeed to have diminished every where. In the days of ancient Rome, under various consuls and emperors, more were imported in a single year from Africa, for the purpose of the combats of the amphitheatre, than could now be collected in five. This noble animal exists, with trifling variations as to colour and developement of mane, throughout Africa, and thinly throughout India and Persia, as far as the confines of China.

Having dwelt at some length on the Lion, we need say less of the tiger and other animals of this race, as all present a general similarity of character. We cannot, however, altogether pass them by.

The TIGER, *(Felis tigris,)* is nearly as large as the lion, and though not so powerfully made, nor so majestic in its air and movements, is more agile and rapid, and therefore perhaps more dangerous. The markings of its fur are very beautiful, a series of dark transverse stripes being laid on a rich yellow ground. This ferocious animal is confined to Asia, and is spread through the whole of India as far as the north of China. In Sumatra their number is scarcely credible, whole villages being sometimes almost depopulated, and the cattle destroyed by their ravages. Hunting the Tiger, though very hazardous, is at the same time a very favourite sport in the east; and as horses cannot be brought to stand steadily in the combat, elephants are employed on the occasion, which, though often dreadfully agitated, yet in general preserve sufficient firmness to allow the riders to take aim with the musket. The parties are placed in a howdah, or cushioned seat, on the elephant's neck, and the sagacious animal, whose enmity to the Tiger is very remarkable, proceeds cautiously to beat up the jungle, in order to force the dreaded monster into the open country. The late Bishop Heber thus describes one of these forays. It appears that a Tiger which had done a good deal of mischief was discovered in the "adjoining *tope*," and a party was formed to dislodge, and if possible destroy the unwelcome neighbour:—"A number of people on foot and horseback attended from our own camp and the neighbouring villages, and the same sort of interest and delight was evidently excited which might be produced in England by a great coursing party. The rajah was on a little female elephant, hardly bigger

than the Durham ox, and almost as shaggy as a poodle. She was a native of the neighbouring wood, where they are generally, though not always, of a smaller size than those of Bengal and Chittagong. He sat in a low howdah, with two or three guns ranged beside him ready for action. Mr. Boulderson had also a formidable apparatus of muskets and fowling-pieces projecting over his *mohout's* (driver's) head. We rode about two miles across a plain covered with long jungly grass, which very much put me in mind of the country near the Cuban: quails and wild-fowl arose in great numbers, and beautiful antelopes were seen scudding away in all directions." After beating up the jungle, "at last the elephants all drew up their trunks into the air, began to roar, and stamp violently with their fore feet. The rajah's little elephant turned short round, and, in spite of all her mohout could say or do, took up her post, to the rajah's great annoyance, close in the rear of Mr. Boulderson. The other three went on slowly but boldly, with their trunks raised, their ears expanded, and their sagacious little eyes bent intently forward. 'We are close upon him,' said Mr. Boulderson; 'fire where you see the long grass shake, if he rises before you.' Just at that moment my elephant stamped again violently. 'There! there!' cried the mohout, 'I saw his head.' A short roar, or rather loud growl, followed: and I saw immediately before my elephant's head the motion of some large animal stealing through the grass. I fired as directed, and a moment after, seeing the motion still more plainly, fired the second barrel. Another short growl followed; the motion was immediately quick-

ened, and was soon lost in the more distant jungle. Mr. Boulderson said, 'I should not wonder if you hit him that last time; at any rate we shall drive him out of the cover, and then I will take care of him.' In fact, at that moment, the crowd of horse and foot spectators, at the jungle side, began to run off in all directions. We went on to the place, but found it was a false alarm, and in fact we had seen all we were to see of him, and went twice more through the jungle in vain."

The Tiger steals upon his prey or awaits it in ambush, and springs upon it like the lion; but he is active by day as well as by night, from which cause he is more dangerous to travellers, who too frequently fall his victims. His strength is very great, the weight of a man or of a much more ponderous animal occasioning no embarrassment to his rapid and bounding movements.

The LEOPARD is another of this rapacious family, preeminently distinguished for its beauty, elegance, and grace. It is a native of Asia and Africa, and preys upon antelopes, deer, and monkeys, which latter it follows up the trees with the dexterity of a cat. It seldom attacks man voluntarily, but, if provoked, becomes a formidable antagonist. In the ease and celerity of its bounds nothing can equal it, and the flexibility of its body and limbs enables it to creep along the ground with the cautious silence of a snake upon its unsuspecting prey. In size the Leopard is considerably smaller than the tiger; its skin, the

ground of which is yellow, is covered with beautiful



open rosettes of black, which contract into spots about the head, neck, and limbs.

A species allied to the leopard, the CHETAH, *(Felis jabata,)* but which also indicates, by the shape of its feet, the formation of the claws which are only semi-retractile, the slenderness of its limbs, and the relative tallness of its stature, an approach to the canine species, is used in India for the chase of the deer and antelope. It is taken, collared and hoodwinked, into the plains on a sort of wheeled carriage; when any herds are in sight, the hood is taken off, the collar slipped, and silently as death creeps the Chetah towards his victims, availing himself of every bush, tuft of herbage, or inequality of the ground, till within due distance, and then one or two enormous bounds, and

the victim lies prostrate: the keeper then comes up, coaxes him, gives him some food as a reward, and, having hoodwinked him, replaces him again on the carriage. Of this animal there are two splendid specimens in the Gardens of the Zoological Society.

The vast continent of America, though abounding with smaller animals of this sanguinary genus, possesses none which can at all compete with the lion of Africa or the tiger of the Asiatic jungles; still there are two at least of no ordinary pretensions, which well maintain the characters of the tribe in the woods and wilds of the transatlantic world. These are the *Puma* and the *Jaguar*.

The PUMA, *(Felis concolor,* LIN.) has been sometimes termed the *silver lion;* to the lion, however, it bears no approach either in appearance or powers: unless impelled by necessity, it seldom or never ventures to attack man, but confines its depredations to cattle, monkeys, and the wild animals of the forest; of which the peccary and the capybara are the chief. For these it lurks among the reeds and thickets by the sides of rivers and marshes; nor is the alligator secure from an attack as it raises its head from the water, or crawls out upon the bank. The form of the Puma is light and slender, and the head is small; but the limbs, though long, are prodigiously muscular. The movements of the animal are characterized by freedom and energy, as it bounds along or leaps from the ground into the branches of some tree of antique growth,

which it often fixes upon for a lurking-place. The colour of the adult is a beautiful silvery gray; but, as is the case with the other plain-coloured species of this genus, the young are variously spotted and striped with dark markings on a fawn-coloured ground, the muzzle being black: these marks, however, gradually disappear with age; but the true silvery tint of the fur is not acquired until the animal is fully grown.

Wild and ferocious as the Puma is, it has been not unfrequently domesticated. Of its powers and depredations we have many accounts. Lieutenant Mawe, in his Travels in South America, gives a lively description of an encounter between one of these animals and a Peruvian, of gigantic strength and stature, who, but for the arrival of assistance, would have fallen a sacrifice to his temerity; as it was, he carried the marks of the wounds inflicted by the animal's claws and teeth during the rest of his life.

In size the Puma is equal to a full grown leopard or panther. It is spread over the greatest part of South America, and the southern districts of the northern portion; but every where retreats as man advances: hence it was formerly abundant where it is now seldom heard of.

The Jaguar, *(Felis onça,* Lin.) is closely allied to the leopard in the beautiful markings of its skin; but when fully adult, is far superior in size, frequently measuring from four to five feet from the nose to the root of the tail. The body is extremely robust, the limbs short, thick, and muscular; the head large and

square; and the whole contour deficient in that grace and suppleness so characteristic of its Asiatic congener. It may be considered as the most formidable of American beasts of prey; for though it seldom ventures to attack man, especially if on his guard, it unsparingly destroys horses, oxen, and other domestic animals. The ravages on the herds and flocks of the farmer thus committed are sometimes of considerable extent. It generally happens, however, that as soon as there are signs that one of these ferocious animals is lurking in the neighbourhood, those persons who are interested in preserving their cattle, and those who delight in the hazards of the chase, combine their forces, and make a sortie against the aggressor, which generally ends in his death. Domestic cattle are not the sole food of this tyrant of the American forest; the monkeys know him for their most fatal enemy, as do the peccaries, around the troops of which he is perpetually hovering; in some parts, especially along the larger rivers, the capybara, (the largest animal of the *rodent order,)* constitutes, according to M. Humboldt, the chief means of his subsistence. This celebrated traveller gives many accounts of the Jaguar, which he often met with, and sometimes under circumstances of no little personal risk.

The Jaguar not only climbs trees with the utmost facility, among which it pursues the monkey, or crouches in ambush for its prey, but swims with equal ease. Indeed, it is said, most probably when other food is scarce, to lurk among the herbage by the water's edge, or even half way in the water, in order

to strike such of the finny tribe as come within its reach.



Something similar to this has been observed with regard to the *domestic cat,* which has a decided liking for this kind of diet.

Though man is in general safe from the attack of the Jaguar, children have been frequently carried away; and M. Sonnini relates, that during his travels in Guiana, he and his party were *dogged* by one for two successive nights, which hovered about in hopes of being able to seize some unwary straggler; such was the rapidity of the animal, that, though often seen, it was impossible to get a shot at him before he

again disappeared among the bushes. Like all the tribe, the Jaguar generally bounds upon its prey unawares, dashing it to the earth, and then bearing it away to a more secure retreat.

The ground colour of the fur is a beautiful fawn yellow, covered with rosettes like those of the leopard, only of a larger size, and more open, especially on the shoulders, while those of the back have a central black spot in each; along the spine extends a chain of black oval spots; and on each side of the neck, just before the shoulder, is a decided black line of several inches in length, which forms a marked feature.

There is sometimes found a black variety, with the markings of a deeper and more lustrous hue.

The Jaguar is spread over the same portions of the American continent as the Puma; but is most abundant in the southern and warmer regions.

Many subordinate animals, (Tiger-cats and Lynxes,) of the feline race still remain; but as our object is to present the characters of groups in a *scientific* point of view, rather than of isolated species, and as it would be merely a repetition of the picture already drawn were we to add to our list, we shall now pass on from the *feline* to Cuvier's third and last tribe of the carnassiers, the *Seals*.

The Seals, or amphibious tribe of carnassiers, exhibit in their construction a remarkable and beautiful example of adaptation to the station appointed by their Creator. While the rest of this great *family* are

confined to the land, on which they find their prey, the species of which this division is composed are natives of the water, where they pursue fishes and other marine animals as their food. Their limbs are short, and so enveloped in the skin as to give them the power of creeping only, and that with great awkwardness, on *terra firma;* but as the feet are webbed, they serve most admirably the purpose of *oars;* and such is their natural use. In fact, these are animals which pass a great portion of their life in the sea, only coming occasionally on shore to bask in the sun, or suckle their young. In connexion with their aquatic habits, the general form of the body is elongated, and tapering; the spine very flexible, and provided with muscles which bend it with great force; the fur smooth and close and lying against the skin, and the details of the internal anatomy in conformity with the external characters.

The present tribe embraces two decided genera; the first of which is that of the true Seals, *(Phoca.)* The dentition of the Seals denotes a truly carnivorous appetite, the canine teeth being pointed, and the back-teeth or grinders all furnished with cutting edges, without any tuberculous surface in most species; but in others, which constitute one or two *subgenera,* the grinders have more right to that title, inasmuch as they exhibit lobes, more or less prominent. The feet have five toes; on the fore feet these are graduated regularly down from the thumb to the last, which is the smallest; but on the hind feet, the thumb (or that which may be so called for distinction sake) and the

last are the longest, the intermediate ones being shorter. The tail is short and placed between the hind paws or flippers, which are directed backwards. The head resembles that of a short-muzzled dog, with an expression of great intelligence and mildness, corresponding to the actual character; for the Seal is easily tamed, and becomes much attached to its master. The tongue is smooth; the nostrils are furnished with a kind of valve, which is closed when the animal dives; the cellular tissue which intervenes between the skin and muscles is very loose and fibrous, and appears to be a receptacle for the blood during the suspension of breathing under water, where it can remain a long time without injury. During this period of submersion the blood cannot pass through the heart, or, in other words, freely circulate, and so accumulates in the larger veins; and to relieve these of an undue pressure this loose tissue appears to be designed, as it is found in all animals whose habits are similar or approach those of the Seal, differing only in a more or less degree of developement according as the necessity for it may be. The blood itself is abundant, and, by its dark appearance, would seem to indicate a less perfect state of oxygenation than is necessary for animals of habits entirely terrestrial.

Cuvier has divided the true Seals into various *sub-genera*, depending upon minor points of distinction. Overlooking these, we shall present, as an exemplar of the group, the COMMON SEAL, *(Phoca vitulina.)* This animal is pretty common upon the rocky coasts of Scotland and Ireland, abundant along the northern shores of Europe and America, and found in the

Caspian Sea, and the fresh water lakes of Russia and Siberia. Its average length is about five feet; its colour is yellowish gray, clouded or dappled with brown and yellow; the lips are furnished with long stiff whiskers, the external ears wanting.

The Seal is gregarious in its habits, frequenting the deep recesses and caverns of our northern shores, to which it resorts for a breeding place: here, during winter, the female produces her young, generally two at a birth, suckling them for a few weeks on the spot, till they are strong enough to be taken into the water; where they are conveyed by the parent, who displays great solicitude for their safety: she teaches them to swim and pursue their finny prey, and carries them when fatigued on her back.

The Seal is often surprised basking on the shore, when its first effort is to make for the sea, in which it feels itself at home; on land it is in fact defenceless, its whole energies being required in order to "*scuttle*" along, which it does with a sort of awkward celerity, sometimes managing to upset an inexperienced antagonist.

From the nature of its food the Seal has a fishy smell; and it is said that when collected in numbers on the shore, the odour can be perceived at some distance. The voice of this animal when old is a hoarse gruff bark; when young a peculiarly plaintive whine.

To the Esquimaux and Greenlanders the Seal is of the utmost importance; in fact, their main subsistence may be said to depend upon their success in capturing this animal; and its pursuit becomes a serious occu-

pation. In his boat, or *kajak*, which consists of the skin of the seal over a slight frame-work of wood, and dressed in the same, the Greenlander braves the violence of a northern sea, and every peril, in the ardour of the chase.

> There, " tumbling in their seal-skin boat,
> Fearless, the hungry fishers float,
> And from teeming seas supply
> The food their niggard plains deny."

" The Seal's flesh," says Crantz, " supplies the natives with their *most palatable* and *substantial food.* Their fat furnishes them with oil for lamp-light, chamber and kitchen fire; and whoever sees their habitations presently finds that if they even had a superfluity of wood it would not be of use; they can use nothing but train (oil) in them. They also mollify their dry food, mostly fish, in the train; and, finally, they barter it for all kinds of necessaries with the factor. They can sew better with fibres of the seal's sinews than with thread or silk. Of the skins of the entrails they make their windows, curtains for their tents, shirts; and part of the bladders they use at their harpoons; and they make train-bottles of the maw (stomach).... Neither is the blood wasted, but boiled with other ingredients and eaten as soup. Of the skin of the seal they stand in the greatest need, because they must cover over with seal skins both their large and small boats, in which they travel and seek their provision. They must also cut their thongs or straps out of them, and cover their tents with them, without

which they could not subsist in summer. Therefore no man can pass for a right Greenlander who cannot catch seals. This is the ultimate end they aspire at in all their device and labour from their childhood up." To make himself a useful or good member of society on that dreary shore, this art, dangerous and difficult as it is, must be perfectly learned by every native.

Though not so important to us as to the poor Greenlanders, still the Seal is much sought after for the sake of its skin, which is an article of commerce, as well as for the oil which it yields in considerable abundance. They are therefore hunted in the months of October and November, at night by torch-light. The hunters in boats proceed up the caverns and deep recesses where these animals are known to associate in large herds after the breeding season, and, being properly stationed and armed with clubs, alarm the seals by shouts and noises; the poor animals, terrified by the uproar, and confused by the light, hurry from the ledges of the rocks and places where they are resting, and endeavour tumultuously to escape; the work of slaughter then commences, the hunters knocking them on the head with their clubs, so as to stun or kill outright.

The Seal, though the ears are cropped close to the head, has a most delicate sense of hearing, and delights in musical sounds: this fact was not unknown to the ancients. Laing, in his account of a voyage to Spitzbergen, states that a numerous auditory of seals would surround the vessel and follow it for miles when the violin (as was often the case) was played on

deck. And the late Sir Walter Scott, in allusion to this singular trait in the nature of the animal, says,

> "Rude Heiskar's seals, through surges dark,
> Will long pursue the minstrel's bark."

Among many instances of the domestication of the Seal and its use in fishing, we select the following anecdote, with which we close our account. "In Jan. 1819, a gentleman in the neighbourhood of Burntisland, county of Fife, Scotland, completely succeeded in taming a Seal. Its singularities attracted the curiosity of strangers daily. It appeared to possess all the sagacity of a dog, lived in its master's house, and ate from his hand. In his fishing excursions, this gentleman generally took it with him, when it afforded no small entertainment. If thrown into the water, it would follow for miles the track of the boat; and, though thrust back by the oars, it never relinquished its purpose. Indeed it struggled so hard to regain its seat, that one would imagine its fondness for its master had entirely overcome the natural predilection for its native element."

The next distinct genus is that of *Trichechus,* which contains but one species, as far as is hitherto known, namely, the MORSE, or WALRUS, *(Trichechus rosmarus.)* The Morse resembles the seal in the general conformation of its limbs and body, but is much larger, and more thick and clumsy in its proportions. Its great singularity consists in the construction of the skull. The lower jaw wants both incisor and canine teeth,

and is compressed laterally to fit in between two enormous canine teeth, or tusks, which arise out of the upper jaw, and are inclined downwards with a gentle curve; the length of these tusks is sometimes two feet, and of a proportionate thickness. The *alveoli* or sockets necessary for the reception of their roots, are consequently so large and protuberant, as to occupy the whole of the anterior portion of the upper jaw, and give a roundness to the form of the muzzle; while the nostrils, instead of terminating a snout, are situated far above the mouth, on what appears the middle of the face. The molar teeth are four on each side above and below; the ears are merely two small orifices; the head is small in proportion to the bulk of the body; the neck is short; the lips thick, the upper being divided by a longitudinal furrow, and studded with strong bristles; its skin is very thick and impenetrable, and covered with smooth yellowish hair. This huge animal often measures eighteen or twenty feet in length, and ten or twelve in circumference round the chest.

The Walrus inhabits the icy seas of the north, and, like the seal, is gregarious in its habits, assembling in vast herds; and, though far from being ferocious, is dangerous when attacked, not only from its great strength and its formidable weapons, but because numbers instantly hasten to succour a companion in distress: boats have thus been frequently endangered. The females defend their young with the most determined resolution.

This singular animal resorts to floating islands of

ice or to the ice-bound shore, both to breed and rest at night; and hence the service which its long tusks perform. These are instruments furnished by the Creator (who careth for all his works) for the purpose of enabling the creature to ascend the slippery and steep acclivities or precipitous ledges of the ice; an attempt which would often fail were it not enabled by striking their points into the glassy surface, to secure itself firmly, and draw up its unwieldy body. In addition to these instruments, Sir E. Home states, that he has discovered another and still more remarkable provision, which, if substantiated by subsequent examinations, cannot fail to impress the mind with reverence and admiration. All have seen how a fly can walk up glass, or along the ceiling of a room: the feet are furnished with *suckers,* or a little apparatus acting on the principle of a cupping-glass exhausted of the air. In the *hind feet* of the Walrus there is, *according to that anatomist,* a similar apparatus,* and for a similar purpose, namely, to give the feet a tenacious adherence to the slippery ice, so that it may have the power of propelling itself forwards from a firm *point d'appui.* Thus, by means of its tusks on the one hand, and its *suckers* on the other, the Walrus can climb the

* We are not aware that Sir E. Home's statement has yet been confirmed, as opportunities of dissecting this animal seldom occur in England or France. We have never examined the animal in a recent state ourselves, and therefore give the account with hesitation, and solely upon that gentleman's authority: if correct, it is indeed a wonderful example of the provisional adaptation of means to the end.

iceberg with security, traverse its surface, and leave it at pleasure for the waters of the ocean.

Captain Cook, in his celebrated voyages, thus describes his meeting with walruses off the northern coast of America. "They lie in herds of many hundreds upon the ice, *huddling over one another* like swine, and *roar* and *bray* so very loud that in the *night*, or in foggy weather, they gave us notice of the *vicinity of the ice* before we could see it. We never found the whole herd asleep, some being always on the watch. These, on the approach of the boat, would awake those next to them; and the alarm being thus gradually communicated, the whole herd would be awake presently: but they were seldom in a hurry to get away till after they had been once fired at; they then would tumble over one another into the sea in the utmost confusion, and if we did not at the first discharge kill those we fired at, we generally lost them, though mortally wounded......The dam, when in the water, holds the young one between her fore-arms."

From all accounts the Walrus is far from being deficient in intelligence; it is, however, useful to man only inasmuch as its tusks produce the most valuable and finest ivory, and its abundant fat, oil. All the marine mammalia of the northern seas are well supplied with this as a defence against the cold. Immediately beneath the skin a thick layer envelopes the body, and being a bad conductor of caloric, keeps in, so to speak, the vital heat; another beautiful evidence of design!

The Walrus has a formidable enemy, besides man, in the polar bear, with which it is said to have frequent and desperate conflicts. Its food appears to consist of various sea-weeds, and, perhaps, fish and crustacea.



The above is a sketch of the Skull of this extraordinary animal.

ORDER IV.—MARSUPIALIA.

Teeth variable; body furnished with an external pouch for the reception of the young, the birth of which appears premature, and their organic developement imperfect.

We now arrive at Cuvier's fourth order, or the Marsupialia;* that is, animals furnished with a pouch for the reception and nourishment of their young.

If we except the wild dog, which is suspected, and with reason, to be of comparatively recent introduction, the whole of the mammalia of Australia offer a striking peculiarity in their conformation, a peculiarity in which, however, a few animals of a very distant portion of the globe, namely, America, also participate, as well as a limited number in a nearer quarter, namely, the Celebes and Molucca Islands. This peculiarity not only consists in an external apparatus, or pouch, possessed by the females for the reception of the young, in a premature or imperfect state, and in which they continue until they acquire a due degree of developement, but in many anatomical and physiological peculiarities which still remain difficulties unsolved by the researches of the scientific, and which, as they are foreign to the nature of our present treatise, we shall here pass over. That the whole of the mammalia of so extensive a country as Australia should be distinguished by anomalies of anatomical structure,

* Marsupium, a pouch or sack.

in which they are resembled by a few only of the animals of any other country, is a fact of no little interest, and opens a wide field for speculation and inquiry. One point, however, forces itself upon us, that nature, as if to declare the omnipotence of her great Author, seems in this order to manifest how multiform are her resources, and how endless her means, which, as if to set at nought our preconceived ideas, built upon contracted views and limited experience, she here presents to philosophic investigation. Nature, indeed, at every step teaches us a lesson of humility, nor less plainly points to Him who in the fulness of His glory is "past finding out."

In asserting that the whole of the quadrupeds of Australia are marsupial, we do not forget the *echidna* and *ornithorhynchus*, which are referred by Cuvier to another order, the *Edentata*, with which, it is true, they have many points in common; but still, though deficient of an external pouch, they present so many of those essential modifications of structure, upon which the present order is founded, as to render it doubtful whether they might not with more propriety be included among its genera.

The animals of the marsupial order, agreeing among each other in certain points of structure, still present an anomalous group, in which are to be found representatives of every other. They differ widely in food, habits, and manners, and consequently in their teeth, limbs, and bodily energies; many, for example, are insectivorous; others decidedly carnivorous and ferocious; and others feed entirely on fruits and vegeta-

bles. Thus the insectivora, the true carnassiers, the rodentia, the edentata, and perhaps the ruminantia might divide among themselves the subjects of this order. Regarding it in this light, many are inclined to condemn the arrangement adopted by Cuvier; but as it is not our intention to enter into controversy, we shall proceed to select a few of the most prominent examples as the order at present stands.

The first subdivision of marsupial animals, and the largest known, because comprehending the species peculiar to America, is that of Didelphis, or the Opossums. The animals of this genus are nocturnal and insectivorous, feeding also on small quadrupeds, eggs, and birds, which they pursue with great agility among the trees; nor do they refuse fruits and other vegetable substances. The tongue is rough, the tail prehensile and partially naked; the thumb of the hinder hands is long, without a nail, and capable of being opposed to the fingers; the mouth is wide, the ears large; the teeth, more numerous than in any other race of mammalia, amount to fifty, of which there are ten incisors above and eight below; seven cheek-teeth on each side above and below, of which the posterior four have an insectivorous character; the canine teeth are four, as usual.

In most of the species of this American group, the females have the pouch fully formed and deep; in some, however, peculiar to the warmer regions of America, it is merely rudimentary, the young being carried on the mother's back with their tails curled

round hers for security, as is exhibited in the annexed sketch, which represents a species from Cayenne,



(Didelphis nudicauda,) closely allied in colour, &c. to the VIRGINIAN OPOSSUM, *(Didelphis Virginiana,)* which latter we shall offer as an example of the genus. This animal is distributed from the equatorial regions of America to the temperate latitudes of the north, and is found abundantly in the United States, residing in woods and thickets near hamlets and villages. It preys upon small birds and eggs; but, like the polecat in Europe, proves also a destructive neighbour to the farmer, upon whose premises it prowls at night, and makes great havoc among the broods of poultry. Its

size is that of a cat; its colour a dirty yellowish white; its tail, which is long and capable of grasping very firmly, is covered, the greatest part of its length, with whitish scales, between which spring out a few slender bristles. The head is long, the muzzle ending in a sort of snout; the eyes are small, extremely prominent, and without external lid, the pupils slit vertically; the toes, or rather fingers, five on each foot. Of the senses that of smell seems especially acute, and the touch is very perfect also.

The Opossum is by no means distinguished for intelligence; nor is it capable of that resolute defence which its wide mouth and sharp teeth would lead one to expect. Its odour when attacked is very disagreeable, and is apparently one of its modes of annoying an adversary. It is, however, not only a prey to eagles, falcons, and ferocious beasts, but suffers from man, being hunted for the sake of "its flesh and fat." The time chosen for the pursuit is generally moonlight, night being the season of its activity. "The Opossum," says Dr. Goodman, the American naturalist, "as soon as he discovers the approach of his enemies, lies perfectly close to the branch, or places himself snugly in the angle where two limbs separate from each other. The dogs, however, soon announce the fact of his presence by their baying, and the hunter, ascending the tree, shakes the branch upon which the animal is seated with great violence, to alarm and cause him to relax his hold. This is soon effected, and the Opossum attempting to escape to another limb is pursued immediately, and the shaking is renewed with greater violence, until, at length, the

terrified quadruped allows himself to drop to the ground, where hunters and dogs are prepared to dispatch him. Should the hunter, as frequently happens, be unaccompanied by dogs when the Opossum falls to the ground, it does not immediately make its escape, but steals slowly and quietly to a little distance, and then gathering itself into as small a compass as possible, remains as still as if dead. Should there be any quantity of grass or underwood near the tree, this apparently simple artifice is sufficient to secure the animal's escape, as it is difficult by moonlight or in the shadow of the tree to distinguish it." When he considers the danger over, he endeavours to creep off as silently as possible; but upon any shout or noise, he immediately resumes his "deathlike stillness and attitude," which he maintains even when discovered and handled. The circumstance of this animal feigning itself dead, has, it seems, given rise to a proverb current in the United States; and "He's playing *'possum,*" is applied to any one acting in a sly deceitful manner.

To the American genus Didelphis, succeed others peculiar to Australia, characterized, among various points of difference, by a want of the prehensile power of the tail, so conspicuous in that group: the insectivorous appetite is, however, continued through all, the species in a few of the genera being also decidedly carnivorous. Such is the DOG-HEADED OPOSSUM, (*Thylacinus cynocephalus*, TEM.) an animal as large as a middle-sized dog, and of a gray colour, with dark transverse bars beginning small across the middle of the back, and gradually enlarging as they proceed to

the tail. It frequents the sea-shore of Van Dieman's Land, where it feeds on flesh, for which its formidable teeth expressly adapt it. Such also is the URSINE DASYURUS, *(Dasyurus ursinus,)* from the same locality, an animal about as large as a badger, and extremely voracious. Of the habits and manners of this race of animals, a minute account is still a desideratum.

A second division of the marsupial animals is that which contains the Phalangers, (so called from the union, by means of an intervening skin, of the two first fingers,) a race peculiar to New Holland, Van Dieman's Land, and the Malaccas. They are vegetable feeders, as well as insectivorous, and live among the trees, which, from their free and long thumb and prehensile tail, they are capable of climbing with great facility. Little is known respecting them, nor do they appear to be interesting from their manners or intelligence. They are slow in their movements, and exhale an unpleasant odour. The principal species are the URSINE PHALANGER, *(Phalangista ursina,)* from the island of Celebes, larger than a cat, with close fur of a dark brown; the VULPINE PHALANGER of New Holland, *(Phalangista Vulpina,)* nearly as large, of a grayish fawn colour, and living in burrows in the woods, whence it comes out at night to chase birds among the trees, &c.; COOK'S PHALANGER, of Van Dieman's Land, *(Phalangista Cookii,)* and others.

There is a tribe of the Phalangers distinguished by an expansion of the skin of the sides passing from the fore to the hinder limbs, so as to form a kind of *para-*

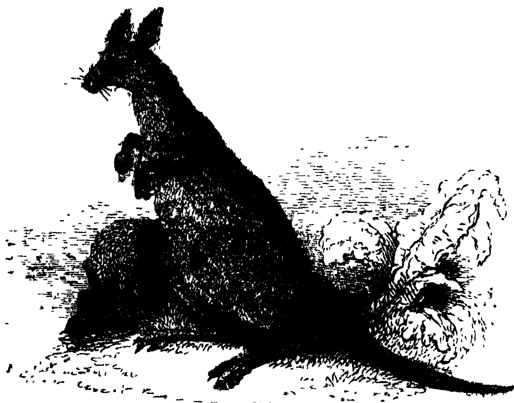
chute, by which is gained the power of taking prodigious leaps from tree to tree, or even continuing, as it were, on the wing for a short period. The animals of this genus (*Petaurus*, SHAW,) are called Flying Phalangers: they are nocturnal in their habits, and lively only during the night. The only living species we have had the good fortune to see, is the SQUIRREL PETAURUS, (*Petaurus sciureus,*) a beautiful little animal, of a delicate gray colour above, with a dark line running down the back, the lateral membranes having a similar edging; the tail is long and tufted, but not prehensile; the under parts are white. It is a torpid and inactive creature, remaining during the day in its box rolled up asleep in wool or soft hay, but coming out at night to feed, and retiring to rest again with the first rays of dawn. Its food is entirely vegetable.

Passing over the third subdivision, (*Hypsiprymnus*, ILL.) which contains the *Kangaroo Rats*, of which little is known, we arrive at the fourth section of this order, and the most interesting, namely, *Macropus*, SHAW, in which are contained those most singular of animals, the Kangaroos. Of these animals several species are recognised, but with one only are we familiar, the COMMON KANGAROO, (*Macropus major.*)

The subjects of the present genus are distinguished by their extraordinary figure and proportions: the hinder extremities are exceedingly developed, and possessed of great strength, while the arms are short and feeble. Their natural position is sitting up on the hind legs, an attitude in which they are supported by

the tail, which is extremely muscular and strong, tapering gradually from a thick and fleshy base. Their mode of walking on all fours is awkward and constrained; but they bound or hop along on their hind limbs with great velocity. Gentle and inoffensive, their food is entirely vegetables. Their defensive weapon consists in the large claw of the hind foot, which is elongated, strong, and armed with a hoof-like nail; with this they can inflict a severe blow.

The Kangaroo was discovered by that celebrated



navigator Captain Cook, in his first voyage; and the novelty of its appearance occasioned no little surprise. Since that period (1770,) it has been brought over in abundance to Europe, and has bred freely in the menageries of Great Britain; so that with a little care it might become, like the deer, an ornament to our

parks and forests, our climate appearing to agree tolerably well with its constitution. On looking at the Kangaroo, we are struck with the conical form of its body, which tapers from the haunch to the small and graceful head which surmounts its slender neck and shoulders. In this contour we see at once the developement of the muscular powers concentrated in the loins and inferior limbs; and it is also evident that from the shortness of its fore limbs they can be but of little service in aiding its progress. When bending down to crop the herbage, it generally rests upon one or both, and can thus limp slowly along; but it trusts for safety entirely to its hind limbs, on which it can bound along, clearing high fences and palings with the greatest ease. The eyes are full and bright, the mouth small, the ears large and pointed; the fore paws are divided into five fingers, armed with nails for scratching or digging; the hind feet into five toes, of which the two inner are very small, and so united their whole length under the skin as to appear in reality but one; these, or, as we may say, this double claw is followed by a large strong toe, projecting forward, and armed with a hard pointed hoof-like nail, as a weapon of defence; on the outside there is again one small claw. The dentition is in every respect as singular: in the upper jaw there are six short incisors; in the lower, two, large, long, pointed, and directed forwards on a level with the line of the jaw; the canine are wanting, so that a long space intervenes between the incisors and the molars, which are five on each side above and below.

Though gentle and capable of being tamed, the

Kangaroo does not appear to be remarkable for intelligence or sagacity. In New Holland, where it attains a large size, some having weighed, it is said, a hundred and fifty pounds, its flesh is much esteemed, and it is hunted alike by the natives and settlers. The dogs used for this purpose, one of which we have seen, are of a breed between the mastiff and greyhound; but large and powerful as they are, one or more are not unfrequently killed in the conflict; for, when driven to extremity, the Kangaroo defends himself with great desperation, and has been known to lay open the bowels of a dog with a single kick. If water be at hand, the Kangaroo always avails himself of it, plunging in, and awaiting the attack of his foes, which he attempts to hold down below the water to drown; if there be only one assailant, he is nearly sure to come off victorious; but, however bravely he may resist, he falls a sacrifice to numbers. Instead, however, of presenting our readers with details of the chase, in which the gratification consists in beholding the desperate efforts of an unoffending creature assailed by dogs and men, we would rather paint a scene of plains and gentle hills, diversified with woods and limpid waters, over which herds of these animals are wandering, free denizens of the land, and in harmony with the novelty of the trees and birds, and "every living thing." Such a scene, instead of awakening the wilder and fiercer passions of human nature, would, we should think, excite in our hearts feelings consonant to the calm and lovely prospect, and incline us to breathe forth our aspirations of praise to Him who clothed the earth with verdure, and called it good.

The last section of this order which we shall notice is that called *Phascolomys*, Geoff. and which contains but one animal, the Wombat, *(Phascolomys Wombat.)* Of this creature, which appears to be allied in many points to the burrowing tribes of the *Rodentia*, we have little to say. An individual is at present living in the menagerie of the Zoological Society; it appears to be a dull torpid animal, with little intelligence or docility. Its size is that of a large badger, but its fur is smooth, and its colour a reddish brown; eating and sleeping divide its time. Its figure is clumsy, shapeless, and fat; the head and neck are thick; the limbs short; its motions slow and awkward; in fact, it appears a personification of passive and indolent stupidity. In New Holland it lives in holes and burrows, feeding exclusively on herbs and fruits: its flesh is excellent. Several, at different times, have been brought to Europe. The late Sir E. Home had one in his possession which lived for some time: and that at present in the Zoological Society's Gardens seems, as far as can be judged of so inanimate a being, in excellent health; so that were it of sufficient importance it might, we think, as is the case with many of the New Holland animals, become easily naturalized in England or France.



ORDER V.—RODENTIA.

Extremities four: the teeth of two kinds only, incisores and molares.

We now enter upon Cuvier's fifth order of Mammalia, the Rodentia, *(rodo, to gnaw,)* or Gnawers, answering to the Glires of Linnæus, and embracing so extended a circle of genera and species as to render it impossible for us to do more than offer a mere selection of the most remarkable examples; and here too we must content ourselves with restricted limits. We trust, however, that we shall be able to give the characters of this order so clearly as to enable our readers to recognise at once any species of animal which truly comes within its limits; we would remind them that our purpose is but to sketch an outline as a preparation for more elaborate filling up by their own industry.

The Rodentia, then, constitute a group of animals neither distinguished for size nor strength, nor for habits of daring and ferocity. On the contrary, generally speaking, they are gentle, timid, and inoffensive, seldom exceeding a moderate stature; the porcupine and beaver being among the largest, while others, as the beautiful little harvest mouse, *(Mus messorius,)* are the smallest of all the mammalia. Their food is vegetable matter, especially of the harder sort, as nuts, grains, twigs, &c.; some few, however, as the *rat,* do not refuse animal diet. Ordained, many of them, to

become the prey of rapacious beasts and birds, the annual diminution of the species, great as it is, is supplied by an annual increase, equal at least to the loss. Hence their fertility is remarkable, many producing six or eight young at a birth, and this two, three, or even four times in the course of the year; so that were there no causes operating as a' check to their increase, keeping it within certain bounds, they would overrun and desolate the earth like armies of locusts. The contour of the body is usually more or less conical, the chest and shoulders being small, while the loins and haunch are robust and muscular, the hinder limbs generally exceeding those before; whence the pace is that of leaping or hopping along.

Thus in their proportions the animals of this order in some degree resemble the kangaroo, and, in a few instances, even exceed that creature in the disproportion between the anterior and posterior extremities. With the exception of the porcupine and two or three others, they are remarkable for their soft and beautiful fur; that of the beaver, and *coui, (Myopotamus coipus,)* as well as of the gray squirrel, is noted, and valuable in commerce. But these are not the only examples, most of the smaller species having the hair even still more delicate and fine.

In many of the genera we find the animals characterized by the power of using the fore arms with great freedom, so that the paws are habitually employed as hands for conveying food to the mouth, climbing trees, or holding any object, as we see in the squirrel and dormouse. In others again this quality is deficient, as in the rabbit and hare. The title *Rodentia* is

given to this *order* from the nature of the teeth, and the uses to which, from their construction, they can be alone applied. That our readers may the better understand our description, let them examine the head of a hare or rabbit, and they will see that there are in each jaw two large and bent incisors or cutting teeth,* of an elongated form, and having edges like a chisel, and that these are separated from the grinders by a wide space, these two kinds of teeth being all that are possessed. In consequence of the mechanism of the articulation of the jaws, the action of the lower one (besides opening and shutting) is simply backwards and forwards, and not from side to side; so that the operation of the incisor teeth is to file down or reduce into fine particles the substances, if hard enough, which are subjected to their action. Now, these incisor teeth have no enamel except on their anterior surface, in order that by the more rapid wearing down of every other part, this hard external layer may form an edge, ever sharp and fine, exactly as the layer of steel on the chisel forms its edge, by the grinding down of the softer metal: still, however, by constant work, both teeth and chisels wear away. Unlike most other animals, in these the teeth never cease to grow, so that the ratio of their wearing away is that of their increase; and so energetic is this law, that should one tooth be lost by accident, or displaced, the counter one of the opposite jaw, wanting an equalizing detrition, increases to an enormous length,

* In the hare and rabbit, (genus *Lepus*,) there are in the upper jaw, besides the large incisors, two additional, or rudimentary; of these, however, we need not take any notice.

so as even to impede the facility of feeding, a circumstance we have several times witnessed in rabbits. As the action of the jaw is backwards and forwards, the molars have flat surfaces with ridges of enamel running transversely across, so as to be in opposition to the horizontal working, in order that they may the more effectually triturate or grind the food. In all this we see a beauty and simplicity of design, which cannot but charm, and lead the reflective mind to the Great Source of all order and harmony, but whom in his works, both of nature and grace, we behold as through a glass, darkly. What shall we not discover when the veil is removed from our eyes! These instances are confusion to the atheist; he dare not look upon them; for, carrying as they do conviction in their very essence, they proclaim that man a fool who disputes wisdom and design in all things, as proclaiming an almighty Maker.

Having thus explained the prominent features of the Order, we shall next notice *some of the principal genera* which it contains; and first that of *Sciurus*, or the *Squirrels*.

The Squirrels are among the most elegant and lively of quadrupeds; their bright full eye, their archness, their light and nimble movements, added to the beauty of their fur, render them universally attractive. The *genus Sciurus* is characterized by having four toes on the anterior and five on the posterior feet; four grinders on each side above and below; the head rather large in proportion; a full and prominent eye; the tail long, with the fur disposed on its sides like a feather; the ears in many species tufted.

The Common Squirrel, *(Sciurus vulgaris,)* is well known; it is to be found throughout Europe in the larger



woods and forests, often in great abundance. It is certainly one of the most beautiful of its genus, nor is it less distinguished for its graceful activity, and its quick and sudden evolutions, as it frolics among the branches, or plays at *hide and seek* with its pursuer, whose observation it is endeavouring to elude. As this little animal cannot be a stranger to our readers, we shall only stay to observe, that it lives in pairs, and builds a substantial nest of interwoven sticks and twigs at the fork of a branch on some tall tree, especially fir: the nest is round, and consists of a chamber covered in with twigs and leaves so as to be waterproof, and lined with a well compacted layer of moss, leaves, and wool, a single small opening being left for entrance. As autumn advances, the Squirrel begins to hoard up various wild fruits, nuts, and acorns, in holes and crevices of trees, to form a magazine of provisions for itself and its young when the snow and ice of winter have locked up other sources.

In America, the place of our species is supplied by several of great beauty, but wanting the pencil of hair with which the ears of that are so elegantly tufted.

Of the American species the most common is the GRAY SQUIRREL, *(Sciurus cinereus,)* which in some districts abounds in incredible numbers, and produces great havoc in the fields of maize, a whole crop being often destroyed in a night. They are a never-failing supply of food to falcons and other birds of prey; nor does man fail to thin their numbers, since their skins are of value as an article of commerce. Besides the gray, there is also a black species or variety, and another species called the MASKED SQUIRREL *(Sciurus capistratus,)* also black, with the exception of the muzzle and ears, the snowy whiteness of which produces a singular contrast.

India and the adjacent islands produce many beautiful species of Squirrel, some of large size; of these the Malabar and the Bicoloured are the chief; the length of the body being fifteen or sixteen inches, and the tail longer; this organ is capable of being folded round the body as a protection against cold. The colour is a chocolate brown, more or less deep, changing abruptly into yellowish straw-colour on the fore legs and under parts, with specific variations.

There are a tribe of Squirrels called Ground Squirrels, *(Tamia,)* from their terrestrial habits, and their residing in burrows; their fur is brown, with black and white longitudinal stripes down the back, and the tail less full than in those of other genera. The best known species is the GROUND SQUIRREL of America, *(Sciurus striatus,* LIN. or *Tamia Striata,* ILL.*)* The burrows of this animal, (which are numerous in the pine forests of North America, and also it would seem

in the north of Asia,) are very skilfully constructed, and serve not only as a winter residence, but as a magazine in which a vast quantity of maize and various grain and fruits is accumulated for a supply during the cold season, when it seldom ventures from its abode.

Another tribe of Squirrels, and which also forms a separate genus, *Pteromys*, is distinguished by lateral membranes from limb to limb, so as to form a parachute, by the agency of which they are enabled to throw themselves from tree to tree at a great distance, or even to sustain a short flight. One species about as large as a rat, and of a gray colour, is found in the forests of the North of Europe. North America produces, among others, the LESSER FLYING SQUIRREL, (*Pteromys Volucella*, CUV.) a most beautiful and lively little creature, living in troops among the trees. Its colour is a reddish gray above, and white beneath, the lateral expansions having fawn-coloured edges bordering a black band. We have had an opportunity of watching an individual of this species in captivity. It was most lively towards evening and at night, when it would come out of its box and frolic about its cage with surprising activity and address, its turns and evolutions being too rapid for the eye to follow. In the midst of an exhibition of this sort, it would suddenly stop and gaze at the bystander intently with its full black eyes, as if seeking to read the expression of his countenance, and then as suddenly resume its frolics. A favourite practice was to roll itself up in wool, with one eye peeping archly through a little

aperture left for that purpose; if food was offered, it unrolled itself and darted like an arrow towards it; or if a stranger presumed to put his fingers within the wires, it hastened to the attack, biting with its sharp but very small teeth. In their native woods the habits of these animals are chiefly nocturnal, and, like the squirrel tribe in general, they store up provisions for winter. Their nests are built in trees with great ingenuity, and are capable of containing several individuals.

We shall detain our readers no longer with this interesting tribe, but proceed to select another genus, *Arctomys*, or the Marmots, containing several species, European as well as American; we shall, however, limit our observations to that which abounds in the elevated regions of Switzerland.

The ALPINE or COMMON MARMOT, *(Arctomys Alpinus,)* is an animal by no means graceful or attractive in its appearance, its proportions being thick and clumsy, its limbs short, and its head large and flattened. Its movements are slow and void of ease, its step being plantigrade. Its disposition is timid and sluggish.

The incisor teeth of the Marmot are so strong that it easily effects its escape from confinement if the cage be of wood, however stout, unless indeed it be lined with iron. Its fur is of a sprinkled gray colour, soft, and woolly, with long silky hairs; the upper lip is cleft. the eyes are large, and the lips furnished with long whiskers.

The Marmot inhabits the higher regions of the Alps and Pyrennees, at the edge of the line of perpetual snow and above the limits of the forest, living in families which labour in the excavation of a common dwelling, in which they pass the winter in a state of lethargy. Their period of activity, if activity it may be called, is during the summer; at this season, though never wandering far from their subterranean retreats, they issue forth to feed on the mountain herbage, one of their number, it is said, always keeping watch like a sentinel against surprise and sudden danger; should suspicious circumstances occur, warning is given, and the whole company seek safety by retreating into their burrows, or, if intercepted, by availing themselves of a temporary refuge amongst the crevices of the rocks.

On the approach of winter, the Marmot betakes itself to its burrow, where it makes a warm bed of dried grass on which to repose during the season of cold. Unlike the squirrel, it provides no winter's stores; and such a provision would be useless, as the time is passed in that state of profound sleep termed *hybernation,* a condition which the Almighty Maker and Preserver of all things has appointed to many animals as the means of ensuring existence. The experiments of one of our most philosophic inquirers, Dr. Marshal Hall, have thrown much light on the condition of animals under such circumstances; from them it would appear that the system, by a wise and beneficent law, undergoes certain modifications essential to the continuance of vitality; the *irritability* of the nervous system increasing in a ratio respective to the decrease of the action of the heart and arteries;

the blood passing sluggishly through the lungs, and undergoing but little apparent change in its transit, a change, essential as it is to activity, far from being requisite under existing circumstances.

The chamber in which the Marmot hybernates is at the extremity of a passage six or eight feet long, from which another often branches at an acute angle so as to form a figure like the letter Y. The entrances are effectually closed against the admission of the cold air of the season with earth, which is procured from the floor of the passages. Having made all secure, the animal reposes on its bed and awaits in oblivious sleep the return of spring.

So will it be with the christian's body; the winter of age or bodily decay closes his summer, and shuts the scene; " the night cometh, when no man shall work." Wearied with the toils of his pilgrimage, and benumbed by the chilling frost, which has shed its snows upon his head, frozen the fountain, and locked up the cistern, he retires to his couch of earth, his narrow bed, to wait in sweet repose the dawn of that bright spring, " the glorious morn, the second birth of heaven and earth," when, through the grace of his God and Saviour, his body shall awake, a new prospect shall open upon his eyes, no changes, no wars arise against him, no chilling blasts, no winter close around him, " but one unbounded spring encircle all."

Passing over several genera, one of which, *Myoxus*, contains that beautiful little animal the Dormouse, well known in the woods and copses of the more

southern districts of England, we come to that containing the Rat and the Mouse; animals too well known to require any particular account. Many of our readers may not, however, be aware that the Common Brown Rat is of comparatively recent introduction in Europe, originally coming from the southern regions of Asia. In 1750 it was introduced into France; but in some departments of that country is yet hardly known. The *Black Rat*, which is a totally different species, is also supposed to be, though more anciently, of foreign extraction; it abounds in the sugar plantations of the West Indies, where it does great damage.

We cannot part from this genus without briefly noticing one of its species, the smallest of British mammalia, and one of the most elegant; we mean the HARVEST MOUSE; (*Mus messorius*, WHITE.) This little Mouse, which is scarcely half the size of the common species, appears to be exclusively belonging to our island; but was totally unknown till discovered by Mr. White, and introduced to science in his Natural History of Selborne. Its colour is that of a squirrel, but lighter; its eyes dark; its action lively. During the winter it lives underground in burrows of its own construction, but breeds in nests, like those of a bird, exquisitely constructed, and interwoven among the stalks of standing corn. Since its first discovery it has been noticed by various writers, but little has been added to the original account, from which we extract the following:—These mice "never enter into houses; are carried into ricks and barns with the sheaves;

abound in harvest, and build their nest amidst the straws of corn above ground, and sometimes in thistles. They breed as many as eight at a litter in a little brown nest composed of blades of grass or wheat. One of their nests I procured this autumn, most artificially platted, and composed of the blades of wheat, perfectly round, and about the size of a cricket-ball, with the aperture so ingeniously closed that there was no discovering to what part it belonged. It was so compact and well filled that it would roll across a table without being discomposed, though it contained eight little mice which were naked and blind."



Above we present a sketch of this interesting little creature, and of its nest, from nature.

Again passing over several genera, we stop at that of *Dipus*, containing many closely allied species under the general title of Jerboa, and which are involved in some degree of confusion. They appear to inhabit somewhat different localities, one or two species abounding in Barbary, Egypt, Syria, and Arabia; the others being widely spread from Russia and Siberia, along the sand-hills which border the Tanais and Volga, through the desert of Tartary, to Hindostan and the Chinese Empire.

The Jerboas, though on a very small scale, resemble the kangaroo in their general contour and the relative proportion of their limbs, the anterior being even smaller in proportion than in that animal. When seen for the first time at full speed, they appear to be supported in their rapid bounds by only two long legs; hence the generic title *Dipus*, (Δις Πους,) two-footed. So great is the speed of these animals when alarmed or pursued as to render it difficult to take them. In making each successive leap they raise the body upon the hind toes, keeping their balance by the assistance of the tail, the arms being at the time pressed so close to the chest as to be scarcely visible: having taken the leap, they descend on their fore feet, and again elevate themselves for another, but with such celerity as to deceive the eye; for it appears as if they constantly maintained the erect position.

The fur of these animals is soft and sleek; the ears large and open; the eye full and round; the muzzle short; and the head, though more obtuse, not unlike in form that of a small rabbit. The dentition closely agrees with that of the rat; the tail is long, and tufted

at the end. The usual posture in feeding is that of sitting up on the haunches, the fore paws being used in the same way as a squirrel's. The only species we have had an opportunity of examining alive is that which is met with so abundantly in Egypt, Syria, and the north of Africa, frequenting sand hills, and ruins half buried in the sand, among which it digs its burrows and retreats: it is the JERBOA, or Jerbo of Buffon, *Dipus sagitta.*



In size the Jerboa is equal to a large rat; its colour is a pale tawny yellow, lighter beneath, the tuft of the tail being black. It is supposed to be the animal mentioned in Isaiah lxvi. 17, under the name of *mouse*, and also in Leviticus among the forbidden animals. At all events it must have been well known to the Israelites as one of the common animals of their country.

The Jerboa lives in troops; their burrows, though

not proceeding to any great depth, are several yards in length, containing a chamber well stored with grass, and in which they make their nest. They are very timid, and when observed playing about their dwellings may be driven in by the least noise. If their retreat be intercepted, they trust to their speed, which is so great as often to baffle a greyhound in the chase. The flesh of these animals, though unsavoury, is eaten by the Egyptians and Arabs, who contrive to take them by stopping all the openings of their burrows except one, which is netted, as in taking rabbits in England. The individual which has fallen under our notice is very shy and distrustful, and apparently not very intelligent. During the day it remains asleep, becoming lively and feeding at dusk, but retiring to rest with the dawn. Like the hare and rabbit, its favourite hours, when in a state of liberty, are in all probability from the twilight of evening till sunrise, when it steals abroad to feed on the dewy herbage, and sport among ruins, whose walls at that hour once reflected the glare of torches, and echoed to the voice of an idolatrous multitude, but are now silvered by the moonbeams in silence and solitude.

The next genus we shall select, as illustrating the *Rodent Order*, is that of *Castor*, of which we are acquainted with but one species, the far-famed BEAVER, *(Castor Fiber.)*

Whether we regard the structure or the habits of this interesting animal, we shall find much to excite our admiration; but when we consider both these points as they mutually influence each other, when

we see how organization is adapted to an appointed mode of life, we shall be constrained to adore the great Creator, whose laws are those of *order, wisdom,* and *goodness.*

The Beaver is, if we may so express ourselves, the



"*beau ideal*" of rodent animals. The incisor or cutting teeth are remarkably large and strong; the molars, which are four on each side above and below, have a flat crown, composed of complicated and tortuous folds of hard enamel; the toes are five on each foot, those behind being webbed, the nail of the second toe being double; the tail is large, oval, flattened above and below, and covered with scales. It is solely an instrument of progression, fitted for aquatic habits, being in fact used as a sort of paddle, in order to enable the animal, encumbered with a heavy mass of timber, (which it has to manage in the water,) to stem a rapid current; it is indeed an additional power in

the water under all circumstances, enabling the animal by its powerful strokes, which are not lateral, but up and down, to dive or rise with instantaneous celerity. But the assertion that it is used as a *trowel* to plaster the mud which lines the habitation of the animal is altogether destitute of truth. In walking on the land the Beaver treads on the entire sole of the hind feet, but on the toes only of the fore; its tail is raised a little from the ground, and the gait is awkward and waddling; indeed its form is better adapted for progress in the water, its limbs being very *short* and *thick*, and of great muscular strength. The eye is small, and rather adapted for twilight than for the glare of day. The external openings of the ears and of the nostrils are capable of being closed, a provision adapted to the diving habits of the animal, and its continuance under the water. Independently of the fur, which is highly valued, and an article of extensive commerce, the Beaver is also noted for the production of the substance called *castor*, used in medicine,* and secreted or prepared by a peculiar glandular apparatus; but the chief celebrity which attaches to this animal arises from its habits, and the skill, perseverance, and labour it displays in the construction of its dwelling.

The instinct of the Beaver, however far in this respect it may exceed that of other animals, begins and ends here. Setting aside the circumstance of its labours with its fellows, on the co-operative system, and the astonishing results, it is not remarkable for a

* Not the substance called castor oil, which is the production of a plant.

high degree of general intelligence; indeed, that kind of intelligence which distinguishes the dog, the elephant, and many other quadrupeds, is at a low ebb among the *Rodentia*, many of which might be chosen as emblems of stupidity.

The Beaver abounds in the higher latitudes of North America; but (if it be indeed the same species) is found also in various parts of Europe and the north of Asia, as, for example, along the course of the Rhone, the Danube, and Weser; a settlement has existed for above a century on the river Nuthe, in the district of Magdeburg; and a similar colony on the river Goldbach, in the lordship of Weltingan, in Bohemia.

It would appear also that at one period this animal existed in Great Britain; but when it became extinct cannot now be traced. Along the Severn several local spots bear titles implying them to have been frequented by the Beaver; one of these, a flat island called *Bevereye*, gives the name to an adjoining hamlet. Giraldus Cambrensis informs us that the river Tievi, in Cardiganshire, was one of those frequented by this animal. The Welsh called the Beaver the "*broad-tailed animal*," and their laws in the tenth century fixed the value of its skin at one hundred and twenty pence, so considerable a price for those days as at once to lead us to conclude that, however abundant it might have been at an earlier period, its numbers had even then been materially diminished.

Where thinly scattered, as at the present time along a few rivers in Europe, and also in some parts of America, where population has encroached upon its haunts, the Beaver leads a solitary life, lives in holes

by the water-side, and appears to lose, or at least never exercises that instinct for building which is so remarkable a trait in its nature. Where numerous, as in the more northern parts of Canada, it congregates in associate bands or colonies, which unite their labours to produce habitations far superior to the kraals of the Hottentot or Caffre. Let us suppose a colony commencing operations: summer is the season, night the time of labour. The first thing is to choose a convenient situation for the establishment of the projected village. The northern bank of a running stream, where the height of the water is pretty uniform; the margin of a lake, but especially an island for the safety it affords, are the localities to which they give preference. Here, if all be favourable, they set to work, and rear their habitations; if, however, the site be a river's bank, and, as is often the case, the water not deep enough for their purposes, (for it must not be frozen throughout its depth during the severity of winter,) they proceed on a different plan. With amazing industry and skill they form a dam across the stream, often to the extent of a hundred feet, so as to bank up the water to the desired level. This dam is constructed with astonishing solidity, and on the best principles and most scientific rules. If the stream be slow, the mound is carried out in a straight line; if rapid, in a curve or crescent of larger or smaller bend, according to the strength of current; the convex or outward bend being of course opposed to the stream. To add still farther to the strength of this bulwark, the side which is to meet the current is perpendicular, the other sloping upwards from a base ten or twelve feet

thick to the top, where its breadth is two or three. The most skilful engineer could not improve upon this contrivance. In the construction of this elaborate work three kinds of materials are used, timber, stones, and clay or tenacious mud; trees of a tolerable size are selected and felled: and here again do we trace the guidance of unerring instinct. The Beavers destined to this department proceed *up the stream* from the site chosen, so as to have the advantage of the current, and not only fix upon such trees as grow conveniently near the water's edge, but fell them so as to fall towards it to save superfluous trouble. They then lop off all the branches and make them up into bundles of different sizes, and next divide the stem into convenient lengths. All these are dragged by united exertions into the water, and sent adrift. In this "*woodman's occupation*" the Beaver's great incisor teeth are his only tools; and very effective they are, for he can divide a common sized walking stick at a bite as cleanly as if severed with a knife. To return: A party with mud and stones in readiness are in waiting to receive the timber, which is laid down crosswise and kept steady with the other materials, the whole being impacted together. In this manner they proceed till the dam is finished. And now they commence the construction of the huts, building them of the same materials, the walls being about two feet thick, and neatly plastered within: each hut, which is of a round or oval form, contains from one to three apartments or stories, and has an opening "made beneath a projection which advances several feet into the stream with a regular descent, terminating at least

three feet below the surface to guard against its being frozen up. This is called by the hunters an *angle*, and a single dwelling is sometimes furnished with two or more." The apartments are dry and warm, and are generally found well stocked with beds of dried grass, leaves, and moss. The roof of these ingenious huts is in the shape of a dome; the height of the structure above the surface of the water varies from four feet to six or seven. Having finished their habitations, the colony next proceed to the formation of a general magazine of food. "Near the entrance and on the outside of their houses the Beavers store up the branches of trees, the bark of which forms their chief subsistence during the winter; and these magazines are sometimes so large as to rise above the surface of the water, and contain more than a cartload of provisions." The number of individuals in each house is usually two or four old ones, and twice as many young, and the number of houses constituting the *village* from ten to thirty. These houses are, however, intended only for a winter residence; holes in the adjacent banks serving them during the summer, and for occasional refuge at other seasons also.

The flesh of the Beaver is very delicious; but it is not so much for this as for its valuable fur that a war of ruthless extermination is carried on against this interesting animal. For the sake of its fur, men, aided by dogs, invade its peaceful habitations, utterly uprooting them, and, if possible, suffering the escape of not a single individual. "Of the numbers thus sacrificed," says the highly talented author of the *Gardens delineated*, "and of the importance of the

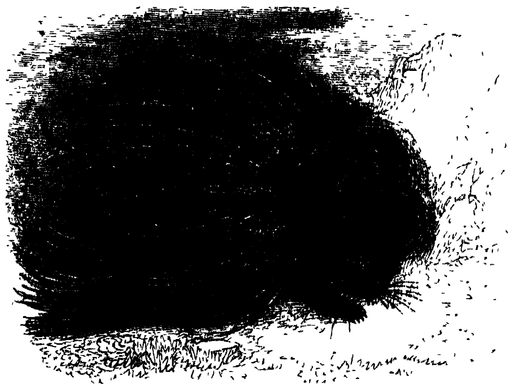
trade, some idea may be formed by the amount of the sales at various places and at different periods. In 1743, the Hudson's Bay Company alone sold twenty-six thousand seven hundred and fifty skins; and one hundred and twenty-seven thousand and eighty were imported into Rochelle; upwards of one hundred and seventy thousand were exported from Canada in 1788; and Quebec alone, in 1808, supplied this country with one hundred and twenty-six thousand nine hundred and twenty-seven, which, at the estimated average of eighteen shillings and nine-pence per skin, would produce no less a sum than one hundred and eighteen thousand nine hundred and ninety-four pounds."

The Beavers which we have had an opportunity of seeing in captivity, provided with a dwelling, and under circumstances foreign to their habits, still manifested the struggles of their prevailing instinct, and were fond of amassing sticks, stones, and mud, as if desirous to undertake that system of operations for which the wisdom of Providence ordained them.

The history of this animal is an admirable comment upon the advantages to be derived from *order, industry,* and *mutual assistance.* The brute indeed often reads a useful lesson to man: "Go to the *ant,* thou sluggard; consider her ways, and be wise." And here we might say, not only to the man of business, but to the christian engaged in labours of mercy and philanthropy, set the Beaver before you, remembering what obstacles, with means apparently inadequate, its *perseverance* and *co-operation* enable it to surmount, and be instructed by the example.

In pursuance of our plan of illustrating the *Rodentia*, we select another genus for consideration, namely, *Histrix*, or that containing the true Porcupines, of which but few species are recognised. As the most obvious example, we shall attach our notice to that species found in Italy, Spain, Sicily, and the northern provinces of Africa; and which it is said was originally imported from the latter country into Europe.

The Porcupine, *(Histrix cristata,)* may at once be



known by the formidable panoply of spines with which it is covered, forming a most effectual means of protection. These spines, however, arise only from the back, the head being ornamented with a crest of long slender bristles, capable of being elevated or depressed at pleasure, and the shoulders and limbs

being clothed with bristle-like hairs lying close upon the skin. The composition of the spines resembles that of the shaft of a large feather, but is more solid, and invested with a coat of enamel, of which the sharp ends are altogether constituted. The spines are not, however, all of one kind; some are extremely long, slender, and weak; but the most numerous are from four to eight inches in length, and very strong, being thick in the middle and tapering gradually to a point at each extremity, that inserted into the skin being blunt, the other more prolonged and very acute. On the tail, which is short, the spines are more thinly set, their place being supplied by numerous open hollow quills, elevated on slender stalks, so as to vibrate with every movement. When irritated, the animal clashes these hollow quills together, producing a singular rustling noise not unlike that made by the rattlesnake, whose tail is furnished with an analogous piece of mechanism, the details of which are merely modified.

The spines of the Porcupine, when the animal is undisturbed, lie down in regular order with the points all directed backwards; but when it is excited or angry, they are raised up by means of a peculiar muscular expansion beneath the skin and attached to it, and which, by its action, influences their elevation or depression. We need not say that the story of the Porcupine's mode of defence by darting out its spines like javelins against an enemy is altogether fabulous; the fact is, that their attachment to the skin is very slight, and it often happens that when clashed vio-

lently together one or two more loose than the rest are disengaged and fall. The mode in which the Porcupine really defends itself is by turning its back towards its assailant, raising all its spines, and pushing laterally or backwards with considerable quickness and great violence; the wounds thus inflicted are very serious, for the points of the spines are not only extremely fine and hard, but armed for some distance with two sharp elevated lines or edges opposite each other, and minutely jagged, the spine itself towards the point being somewhat flattened. A gentleman with whom we are acquainted had the misfortune to receive a wound from an irritated porcupine, one of whose spines penetrated through his boot into the leg, occasioning not only intense pain and inflammation, but consequences which long wore a threatening aspect.

The head of this animal is thick, the eyes small, the muzzle blunt, and the profile very convex; the incisor teeth are of great size and strength, and capable of gnawing through the thickest and hardest boards; though not generally used in self-defence, (for the Porcupine seems anxious to protect his skull, and not expose it to danger,) we have known him use them against another of his own species, biting and tearing with great ferocity. Indeed, a very remarkable instance came some short time since under our notice: two porcupines, which had long lived peaceably together in the same den, quarrelled it would seem during the night, their time of active existence. They must have fought with indomitable fury; one was found dead, much torn, and with every limb bitten com-

pletely off; these were most probably devoured, as they could not be found. The survivor also bore marks of the contest.

The Porcupine is an animal of recluse and unsocial habits, exhibiting in captivity neither familiarity nor intelligence. In its native state it digs deep burrows, in dry and barren situations, as far removed as possible from the haunts of man; these burrows have several entrances, leading to a chamber in which it passes the day in silence and solitude. As evening sets in, and the light fades, it cautiously steals forth to seek its food, which consists of roots, buds, fruit, and other vegetable substances. In this retreat it also appears to undergo a sort of partial hibernation, rousing up, and venturing out occasionally for food, and returning to its accustomed habits of nocturnal activity with the earliest breath of spring.

An animal which burrows in hard and stony soil may be expected to be well provided with implements for digging; accordingly we find the limbs short, strong, and thick, and the toes, which are four before, and five behind on each foot, armed with thick and powerful nails. The length of the Porcupine is about two feet; its general colour is a grizzled black, the spines being elegantly ringed with alternate black and white, and the limbs entirely black. Those brought from Africa are rather larger than those found in the southern states of Italy, and we have seen a still larger variety from India.

Leaving the Porcupines, the genus *Lepus* attracts our attention. It contains the HARE, *(Lepus timidus,)*

and the RABBIT, *(Lepus Cuniculus,)* and several allied species peculiar to foreign regions: for example, in Siberia we find the TOLAI, *(Lepus Tolai;)* in North and South Africa, the *Lepus Capensis;* in North America, a species closely resembling our own hare; and in Brazil, the TAPITI or *Lepus Braziliensis.*

Notwithstanding their similarity, the Hare and the Rabbit are very distinct, never associating together, or producing a mixed race of descendants. Without entering into a detail of their habits and manners, we may observe that the Rabbit is much more adapted for domestication, and has been reclaimed accordingly, exhibiting that inconstancy of colour and those varieties which are the usual results of an artificial mode



of life. Our young readers who have been delighted with care and kindness to feed their Rabbits, will not need any further information as to this their favourite animal.

The Hare is not reclaimed, and is with difficulty rendered familiar even when taken young, nor has it ever, we believe, been known to breed in confinement. Among the few instances in which the Hare is recorded to have been domesticated, or rather familiarized with its keeper, that of three, kept by the poet Cowper, is the most interesting; nor is it without its importance, as it shows how kindness may soften down the innate dread which the most timid of animals entertains for the most formidable of its oppressors.

We shall conclude our sketch of the order Rodentia, by the notice of an animal, which forms the example of a new *genus*, under the name of CHINCHILLA—(BENNETT.) This beautiful little animal, though till lately almost wholly unknown to European naturalists, is the one which produces that soft and highly valued fur, imported from South America as an article of traffic, and so extensively made use of for the purposes of comfort and ornament.

Though the markets had been long supplied with abundance of skins, strange to say the animal producing them has never till within the last three or four years been brought alive to Europe; hence its characters have till within this period remained undetermined. Not that the animal itself has remained altogether without notice; for the Abbé Molina, a native of Chili, in an account of the Natural History of that country, published 1782, described it under the name of *Mus laniger*, or wool-bearing mouse. In 1810 he, however, removed it from the *Mice*, and, at the suggestion of M. Geoff. St. Hilaire, placed it among

the *Hamsters*. But long before the Abbé Molina, Father Joseph Acosta, in his Natural and Moral History of the East and West Indies, published at Barcelona in 1591, and of which a translation appeared at London in 1604, speaks of the "Chinchilles" as a "kind of small beastes like squirrels," with a "wonderfull smoothe and soft skinne."

Since this early writer, various travellers have likewise mentioned it, and among others Sir R. Hawkins, Knight, in his Voyage into the South Sea, in 1593. In all their notices, not excepting even that of Molina, there is much of error and vagueness.

The first living specimen was brought to England by the expedition to the south-west coast of America, under the command of Captain Beechey, and sent to the Zoological Society. Subsequently the Society has received others from various quarters; besides a skull, enabling the true character of the dental formula to be ascertained. Thus fortunately provided with the means for making a careful study of this animal, Mr. Bennett, after a rigorous examination, set it down as the type of a separate genus; and this distinguished naturalist observes, that the slightest inspection of its teeth would serve at once to distinguish it from the groups to which it had been hitherto assigned, and indeed that they differ from those of every other genus of its order.

The genus Chinchilla thus established appears to be one of the links that go to connect "the otherwise widely separated families of the Hares and Jerboas." It may be interesting to know that three individuals are now living in the collection of the Zoological Society.

The CHINCHILLA, (*Chinchilla lanigera*, BENNETT,) is a native of the "alpine valleys" of Peru, Chili, and



probably the whole line of the Andes. In these solitudes it lives in company with its species, forming burrows in the earth, in which it breeds and rears its young, producing, according to Molina, twice a year, and five or six at a birth. As the temperature of its native region, like that of all elevated mountain districts, is below a moderate degree, the creature is protected by a covering of downy fur, not to be exceeded for delicacy and exquisite fineness, and of a length which well adapts it for spinning. The ancient Peruvians manufactured it into stuffs as articles of clothing; and could the Chinchilla be naturalized in England, it might be productive of valuable results.

The Chinchilla, in its general size and aspect, is something like a small rabbit six weeks old; but its ears, though long, are naked, broad, round, and open; and its muzzle is short and blunt, and furnished with long whiskers; the eyes are large, and their expression

mild and gentle; the fore arms are short, and the hands are used, as in the squirrel, while it sits up on its haunches; the hinder limbs, though larger than those before, have not that degree of developement which we see in the rabbit, but are slender and covered with short hair; the toes are four, of which the external is very short and placed far behind; the tail is moderately long, fringed with long hair, and turned back. The colour of the fur is a dark clear gray, lighter beneath, but varying in depth in different individuals; those from Peru, it is supposed, have the fur rougher, less uniform in its texture, and therefore less valuable.

The food of this animal is exclusively vegetable, consisting of bulbous roots and mountain herbage; in captivity, grain, roots, and occasionally clover, form its chief diet. Mild, gentle, and very cleanly, the Chinchilla does not exhibit much sprightliness or intelligence. Like the guinea-pig, it is an inoffensive timid animal; but if we except its beauty, and its novelty in a scientific point of view, by no means so interesting from its manners as many much less favoured by external recommendations. Those in the Zoological Society's Collection are tenants of separate cages, not being disposed to share the same domicile together upon amicable terms; indeed, when introduced to each other on their first arrival, they scratched and pulled each other's fur with their teeth, little in accordance with their pacific habits. An opinion of the instincts and native manners of an animal cannot be formed from one in confinement. Rabbits, notoriously gregarious, will often fight when in a state of domestication.

ORDER VI.—EDENTATA.

Teeth more or less deficient; the incisores always wanting, and sometimes both the canine and molares.

The next Order, as it stands in Baron Cuvier's arrangement, is that called *Edentata,* or toothless mammalia. The term Edentata must, however, be understood in a limited sense only, and as alluding in many cases to a comparative deficiency. In general the incisors are wanting, occasionally the molars, or the canine, and sometimes the teeth altogether.

The order Edentata certainly includes the most singular and isolated of the whole circle of mammalia; its subjects appear, if we may be allowed the expression, to set aside all our pre-established ideas of the laws of animated beings, as if to show to man how multifarious are the resources of the skill and power of Him by whose word they were created. Added to this, their similarity to each other is remote or indefinite, so that they seem bound together under one group by negative rather than by positive qualities; it is easier to say what they want, than what they possess in common. One point of similarity, however, may be stated; namely, their toes are all armed with large and powerful nails, and their actions are slow, or awkward, or ungraceful. The *genera* included in this *order* are very few, and the *species* limited. We shall use our discretion in selecting the most instructive

examples; and first, the genus *Bradypus*, or the Sloths, of which only two decided species are recognised, both natives of the intertropical regions of America; the one, the Aï, or *three-toed Sloth, (Bradypus tridactylus*, LIN.;) the other, the UNAU, or *two-toed Sloth, (Bradypus didactylus*, LIN.) The characters of the genus are briefly these:—the molars, four on each side above and three below, are cylindrical; the canines somewhat longer and pyramidal; the head rounded; the muzzle short; the toes united by the skin, and terminating in enormous crooked nails, compressed laterally and channelled along the under side; in a state of repose they are folded inwards towards the palm. The anterior limbs far exceed in length the posterior, so that in proceeding on the ground, a difficult mode of progression, the animals are obliged to crawl on their elbows. The body is well clothed with rough crisped hair. In the structure of the skeleton, as well as in several other anatomical points, they exhibit important peculiarities. Their natural abode is among the branches of the forest, to which their hook-like claws enable them to cling with the most obstinate tenacity. Their food is vegetable.

We present our readers with a sketch of the Aï, or three-toed Sloth, *(Bradypus tridactylus*, LIN.; *Acheus Ai*, F. CUVIER.) Few animals have had their habits and manners regarded with so prejudiced an eye as the present; and one author seems to have done nothing more than copy the errors of another. Thus has nature been caricatured and falsified by those who ought to have seen from the very outline of the picture

they were colouring that there was something in it incongruous with the harmony which is elsewhere so manifest.



The Sloth has been held up as a personification of helplessness and inertion; as a creature whose motions were painfully slow, so that the task of ascending a tree was the labour of weeks; that there remaining till every leaf was devoured, and obliged at last to descend from mere starvation, it accomplished its object by doubling itself up and tumbling from the top to the bottom. "Prisoners," says a writer, "in the *immensity of space,* and confined almost to the tree *under* which they were born, they are exposed helpless to every attack of danger, and every accident. They

certainly remind us in some measure of those *imperfect outlines* of organized life, those *lusus* (freaks) that *Nature* with an *apparent caprice* sometimes produces, and which the defects of their structure soon cause to be blotted out from the list of living beings, &c."—A passage, to say the least, of unphilosophic tissue, and almost atheistic import. Is there, we would ask, any animal *born to be exposed helpless to every attack of danger and every accident?* What is meant by the Sloth reminding us of "*the imperfect outlines of organized life?*" Where are they? Where and when does Nature capriciously produce any *lusus* or *freaks*, which, as a race or series of beings, though propagated for a time from generation to generation, become at last extinct because of their defects? And why is the term *nature* used as applied to the Agent of this *creation?* Is it because the word GOD, in connexion with *imperfect outlines* and *capricious freaks*, would have made the passage somewhat startling, and led the mind to question the soundness of views clothed in language so vague and repulsive?

The Sloth, however, does not merit the character thus drawn. Those who have had the best opportunities of witnessing the habits of this animal in its native climate and under natural circumstances, while they admit its helplessness on the ground, affirm that in its proper place, that is, among the interwoven trees, its motions are quick and active. Like the *orang-outan*, slow and embarrassed on a level surface, its great length of arm, and the strong hook-like nails with which the toes are furnished, give it no advantage there; the very mechanism of its skeleton pro-

claiming the same. But among the trees it is another thing; contrary to popular opinion, and the theory of Buffon, it there displays great agility and address. In its manner of proceeding along the branches, it does not spring or leap like the monkey or squirrel, (a mode which its conformation renders impossible,) but, hooking on by its great claws, traverses along the under surface of the boughs with its back downwards; its hold being so tenacious as to make it extremely difficult to force it away by violence from the branch to which it clings.

The Sloth is a timid harmless creature; its food consists of leaves, buds, and fruits; its teeth, which are molars only, are five on each side above and four below. The female brings forth a single young one at a birth. Common in Brazil, Guiana, and the intertropical regions of America, its plaintive cry is often heard resounding through the woods, and resembling the letters *A*, *i*, pronounced with a broad accent and wailing tone; and hence its native name. The head is very small and rounded, being little more than three inches in length, while the body is fourteen; the fur is composed of dry crisped hairs, of mingled brown and white, so as to produce a grizzled colour, which is darkest on the back. Between the shoulders there is an oval patch, where it appears as if the hair had been singed with a red-hot iron, so as not only to make it shorter but tinge it with a yellowish orange; this patch is, however, intersected by a black longitudinal stripe. Many varieties, if they be not distinct species, occur, which, besides exhibiting a difference in other details, want this singular marking.

The Sloth is not among that order of beings whose intelligence or docility renders them pleasing or immediately useful to man. If subjected to captivity, so as to be unable to exercise its native instincts, and placed on a flat surface, where its attitude is forced and painful, and its limbs useless, it indeed exhibits a picture of pitiable helplessness. Those who would see it in its true character must study its manners in the forests of Guiana.

America produces another singular genus of the Edentata, namely, that of the ARMADILLOS, (*Dasypus*, LIN.) These animals are remarkable for the armour



of horny plates and belts, in which their bodies are enveloped, the hips and shoulders being covered by large broad buckles, while intermediately the back is shielded with transverse bands, overlapping each other, as we see in ancient coats of mail, so as to give greater

liberty, and some degree of lateral motion. The tail is enveloped in a series of rings, and the limbs in an indurated tuberculous sort of skin. The legs are very short, thick, and powerful; and the toes are furnished with strong nails for burrowing, a process which in the light sandy soil frequented by them they accomplish with surprising rapidity. The eyes are very small; the ears large; the tongue long and slender, being capable of great extension, and lubricated with a viscid saliva, by means of which it is enabled to pick up with readiness ants and similar insects, of which the diet of the Armadillo chiefly consists. Its mode of taking these is by touching them with its tongue, and drawing it back into the mouth. In addition to insects, however, it devours fruits, eggs, snakes, lizards, and especially the carcasses of animals, so that in Paraguay those who are interred at a distance from the "usual places of sepulture, are obliged to be protected by a lining of strong boards," as a preventive against its depredations. In searching after food, the Armadillos appear to be principally directed by the sense of smell; their habits are more or less nocturnal; their retreats are deep winding burrows of their own excavation; their pace, though pretty quick, is a sort of waddling run, which in captivity is often persevered in incessantly by the hour together, without any apparent motive, and which, though amusing enough at first from its oddity, becomes tiresome from its sameness. Many of our readers will, we doubt not, recollect the individuals in the Gardens of the Zoological Society; they are of the species commonly termed

NINE-BANDED, (*Dasypus novem-cinctus*, LIN.;) not, by the by, that the number of bands is a just criterion, as they vary in youth and age; but that as such is the usual number in the adult, it became adopted by Linnæus as a specific appellation. The individuals above alluded to are fed on vegetable diet, and appear to be in excellent health; during the summer months they are allowed the liberty of a little paddock, where, by the singularity of their actions, they attract a crowd of spectators, and come in for a share of the interest excited by the gambols of their fellow-countrymen the spider-monkeys. In the spring of 1831, the female produced two young ones, but both died apparently in consequence of a bite on the head inflicted by one of the parents. Subsequently others have been produced, and reared to their full growth, but died from accidental causes.

In South America the Armadillo is reckoned delicious food, and therefore eagerly hunted. The only refuge of these animals when pursued is their burrow, to which they immediately hasten, but on an emergency endeavour to dig a temporary retreat as expeditiously as possible; if interrupted, as a last resource, they roll themselves up like a hedgehog, and withdrawing their limbs beneath their bucklers and bending in their head, they submissively wait the event: however, it is said that should a precipice be near, trusting to their armour, they will throw themselves over it, and thus often effect an escape. Sometimes they are surprised when in the act of making their burrow, the hunter seizing them by the tail; in this

case he is obliged to tickle the creature thus secured with a stick to make it let go its hold upon the sides of the excavation; for so great is its strength, and so resolutely does it struggle, that its tail has been often known to break off short in the hands of its assailant. Mr. Waterton informs us that the Armadillo burrows in the sand-hills like a rabbit; and that if on introducing a stick into the hole a number of mosquitoes come out, the Indians know to a certainty that the animal is there: they then probe its windings with a long pliant rod, dig down, probe again, and so repeat the work till they reach their booty.

We shall next proceed to the genus *Myrmeçophaga*, or that of the Anteaters, which contains a limited number of animals no less singular in their habits and structure than the armadillos, and also natives of the warmer regions of America. Their food appears to be exclusively ants and termites, which are taken by means of a long filiform tongue, covered with viscid saliva. The head is long, slender, and conical, being thinner than the neck, and terminating in a small mouth, which is totally unfurnished with teeth. The claws of the fore-feet are very large, powerful, and cutting, and serve not only as weapons of defence, but for uprooting the laboured mounds of the ants, in order that they may be obtained in sufficient abundance. The fore limbs and shoulders possess enormous strength. The hair is thick and long. The young, of which only one is produced at a birth, are carried on the back of the mother.

The most remarkable animal of this genus is the GREAT-MANED ANTEATER, (*Myrmecophaga jubata*, LIN.)



We have given an accurate sketch of this extraordinary creature, whose habits appear to be but little known. The first thing in its outward form which strikes the attention is the length and slenderness of the head, which tapers off to a narrow muzzle, having at its extremity a mere slit, in lieu of a mouth, for the protrusion of the tongue; this member, which is the sole instrument by which it takes its insect food, is flexible, pointed, and capable of being protruded to the extent of eighteen inches. The eyes are small and inexpressive; the

nostrils rather large. In walking, the Anteater does not apply its fore feet to the ground in the ordinary way, but treads upon a callous tubercle on the outer edge of the foot, bearing also upon the exterior toe, which is the largest, the claws being doubled inwards; indeed these claws are only capable of being opened so as to form a sort of hook, or rather rake; and the largest, when in a folded state, presses against another callous tubercle on the palm. The toes of the anterior limbs are four; the hind feet are awkward, and plantigrade, the toes being five, armed with short nails, of which the inner is the smallest. The tail is remarkable for its thickness at the base, and the lateral compression of the bones which are continued down it. The arms are thick and clumsy, and appear destitute of freedom, yet the pace of the animal when put to its speed is pretty rapid. The clothing of the Maned Anteater consists of long coarse hair, forming a mane down the neck and back, and enveloping the tail in a thick brush, which trails upon the ground. On the head the fur is close and spare. The general colour is a grizzled black, a dark black stripe bordered with white passing obliquely from the side of the neck to the upper part of the back. This strange animal is a native of the low swampy country from Paraguay to the Rio Plata. Its ordinary motions are heavy and sluggish. Destitute of intelligence, it appears to lead a life of complete apathy, and will even suffer itself to be driven, if not overpressed before its assailant, "with as much facility as an ass:" if hunted hard, it stops, and endeavours to grasp its adversary with its arms, a

more formidable mode of defence than might be surmised; for if it once secures its hold, it fixes its great nails in his body, at the same time squeezing with the force and immovable obstinacy of a vice, retaining the foe till he die either from the violence of the pressure and the wounds inflicted, or from mere starvation; for till death the unhappy prisoner will have no release. It is said that the jaguar has been known to perish under these circumstances, and that sometimes both animals are killed in the conflict. Such occurrences may have happened; but the energy and agility, as well as bodily strength of the jaguar, whose attack is always sudden and impetuous, render it hardly credible that a creature of slow action, and easily killed by a blow on the head, can often come off victorious.

It may at a first view seem a little strange that the food of so large an animal should consist of insects solely. The digestive organs, however, of the Anteater are adapted for extracting nutriment from this diet only; besides, it is not to be presumed that it feeds by any means sparingly; myriads are consumed at a single repast. In dislodging its prey, the long nails and great strength of the fore limbs are of essential service. When an Ant-hill is discovered, (a task of no great difficulty, where they abound in multitudes,) the Anteater sets to work in tearing up the mound, so as to lay open its interior, or at least alarm the swarm and compel them to issue forth; it then protrudes its long and slimy tongue into their midst, which being immediately covered is withdrawn, and again protruded; this action is so rapid, as to

take place twice in the course of a second; and thus the living swarm rapidly vanishes, serving for a single meal.

Instances we believe have been known of this creature being kept in captivity and fed upon a mixed diet of bread and meat; it is not, however; probable that it would exist long, or ever thrive upon such an unnatural regimen.

The height of the Maned Anteater is low in proportion to its length, the body measuring about four feet, and the tail as much more. It is never brought alive to Europe, and specimens are by no means common even in the richest museums.

To the genus *Myrmecophaga* is allied, not indeed in outward appearance, but in anatomical structure, that of *Manis*, or the *Pangolins*, of which only three species appear to be known: one (*Manis macroura*, DESM.) from India and the adjacent islands; another, (*the Phatagin of Buffon*, *Manis Africana*, DESM.) from Africa; and the third, (*Manis Javanica*, DESM.) from the island of Java. As these animals are so closely related to each other, we shall notice their habits and manners generally, without entering into specific distinctions. The name of *Pangolin* is supposed to be a word of African origin, having a reference to the power of rolling up into a ball which this singular race possesses. Like the anteater, the Pangolin is destitute of teeth, and lives on ants and termites, which are taken in the same way, by means of a long round tongue capable of great extension. The head is small; the muzzle pointed; the eyes minute; the external ears

wanting. The body is round and elongated; the limbs are very short and thick, and the toes armed with robust nails adapted for digging; the tail, which is thick at the base, varies in length in the different species, being in that from Africa nearly twice as long as the body. Gentle, inoffensive, and slow, the Pangolin



lives in holes, burrows, and fissures in the rocks, seldom wandering far from its lonely retreat. Calculated neither by disposition nor appetite for a life of predatory warfare, still it fears no ferocious beast which roams the forest "in quest of prey;" and few, perhaps none, of the mammalia have less cause for apprehension; it is in fact invulnerable, being clad in a coat of mail far superior to that of the armadillo. The armour of the Pangolin is indeed a beautiful example of skill and design; and that it should have been bestowed upon a gentle creature, whose actions are slow, and whose haunts are in the midst of beasts

of prey from whom it cannot escape by flight, and whose strength it cannot combat, is one of the many proofs of that law of harmony established by the Creator, by which a certain deficiency, interfering with a due degree of safety, is made up for by an equivalent, so as to secure the balance of well being and happiness. This harmony the philosophic eye will trace not only through the animal kingdom, where endless modifications of forms, of habits, and of appetites, all depend upon each other, and are all linked together so as to form one circle, not only in revolving worlds, "the Pleiades, Hyades, and Orion," and "all the starry host," but in the providences which affect our individual welfare, in the measure of weal or woe, which we may have as our portion, or which may affect a community or a nation, and especially in the carrying on of the mighty scheme of redemption by which man is raised from the degradation of sin, and the corruption of his own heart, to fellowship with God, and an "abundant entrance into life everlasting." To return. The armour of the Pangolin consists of thick triangular scales of horn covering the whole of the body and tail (except along the middle of the under surface of the body) like tiles disposed with the points downwards, each resting upon the other. In the adult animal, they form a coat of defence proof against a musket-ball. Thus clad, the Pangolin rolls itself up on the approach of an enemy, and, winding its tail round the body, quietly suffers the assailant to exhaust his rage in vain endeavours, foiling by non-resistance the efforts of the leopard or the tiger. This animal, though low in stature, acquires considerable size, the specimen *(Manis macroura)* from which our

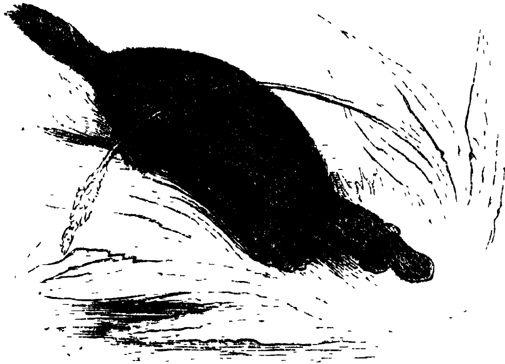
drawing was taken measuring upwards of four feet; and some, it is said, grow considerably larger.

We shall close our sketch of the *Edentata* with the notice of a genus which contains the most extraordinary tribe of animals with which we are at present acquainted, namely, that denominated *Ornithorhynchus**. Of this genus, notwithstanding all that is advanced, we can only number one species varying in the smoothness or crisped texture of the fur, together with a few minor differences much less marked than what are every day seen to occur among other animals confessedly identical; besides, we have traced intermediate states of the fur indicating a process of change (perhaps from age) to be in operation. At all events, as no difference exists in habits and manners, we shall not trouble our readers by wire-drawn distinctions, but at once introduce them to the ORNITHORHYNCHUS PARADOXUS, the *Water Mole* of the English colonists, and the *Mouflengong* of the Aborigines.

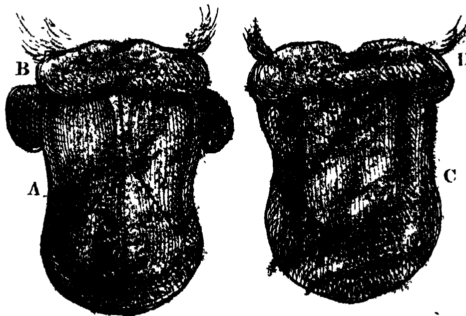
This singular animal, which appears in so many points of its structure to approach the bird, is a native of New Holland, where it frequents the banks of rivers and marshes. It was first described by Dr. Shaw, who gave it the name of "the *Duck-billed Platypus*;" but subsequently the celebrated German physiologist, Blumenbach, conferred upon it its present title, which is the one universally adopted.

Nothing can seem more strange than the combination of outward details which the form of this creature presents, nor is its anatomical structure less marvel-

* From two Greek words, signifying *bird's bill*.



ORNITHORHYNCHUS PARADOXUS.



UPPER AND UNDER VIEW OF THE BILL.

A The upper view of the superior mandible, which has a soft pulpy edge bounded by a depressed line. The two holes near the bottom are the nostrils.

B The leathery membrane surrounding the base.

C The under mandible.

D The leathery membrane at the base of the under mandible.

lous. The length of the Ornithorhynchus is fourteen or fifteen inches; the body is compressed, and covered with fine fur of a dark chestnut colour approaching to chocolate; the head is smali, and terminates in a beak, which, though broader and shorter, very closely resembles that of a duck both in form and structure, having, however, at the base of the upper and under mandible a loose leathery membrane stretching across at its union with the skull. The eyes are so small as to be scarcely visible, but their situation is indicated by an oval spot of white, beneath which they may be found buried in the fur. The limbs are extremely short; and the fore feet are furnished with five strong and sharp nails, being connected together as well as the toes themselves by a tough web, which extends a considerable distance beyond them. On the hind feet there are also five long and somewhat curved claws; but the web extends only to their base; in the male the hind leg is furnished with a strong sharp conical spur, bent obliquely backwards, and capable of inflicting a severe and as some suspect a poisoned wound. The tail is broad, flat, and covered with harsher hairs than the body, which diverge at the tip so as to form an almost forked termination. At the back of the mouth there are small rudimentary teeth, two on each side above and below, without roots, and composed of little vertical tubes. The Ornithorhynchus is aquatic in its habits, being an expert and active swimmer; its dwelling is in burrows in the bank by the water's edge. In its habits it is timid and recluse, and if surprised upon the shore it makes for the water, where it dives among the weeds and tangled herbage, and

from the skill and rapidity of its manœuvres generally manages to escape. On land, notwithstanding the shortness of its limbs, it trips along with great alacrity. Confined exclusively to New Holland, it has become scarce, where it was formerly very common; but it is still abundant in the less frequented districts. When first brought to Europe, its anomalous structure, and the accounts which accompanied it, created no little surprise; and many points, notwithstanding minute anatomical dissection, are still far from being solved satisfactorily.

In an account of the habits of this creature by a gentleman who has had many opportunities of investigating them, and which was lately read before the Meeting of Science and Correspondence of the Zoological Society, we are informed that the spot it chooses for its burrow is the bank of a river "where the water is *deep and sluggish*, and the bank *precipitous* and *covered* with *reeds*, or *overhung* with *trees*. Considerably *below* the stream's surface is the main entrance to a narrow passage, which leads directly into the bank bearing away from the river at a right angle to it, and gradually rising above its highest water-mark. At the distance of some few yards from the river's edge, this passage branches into two others, which, describing each a circular course to the right and left, unite again in the nest itself, which is a roomy excavation lined with leaves and moss, and situated seldom more than *twelve yards* from the water, or less than *two feet* beneath the surface of the earth." Here it brings up its young, safe in its inaccessible retreat from the eyes of the curious.

Similar as is the Ornithorhynchus in many points

of its outward structure to the bird, it also exhibits certain analogies in its internal conformation. Without entering into anatomical details, we may state that it is yet a matter of doubt whether or not it produces eggs, from which its young are afterwards hatched. That it does not produce its young as mammiferous animals in general is universally allowed; but whether it be truly *oviparous,* (that is, producing eggs which are afterwards hatched,) or *ovoviviparous,* (that is, producing eggs which are hatched before exclusion, as is the case with the common viper, *Vipera Berus,* DAUD.) is yet a disputed point. In a communication from Lieut. Maule to the committee above alluded to, and read at a subsequent meeting, that gentleman states, that in several nests, with labour and difficulty discovered, "no eggs were found in a perfect state, but pieces resembling egg-shell were picked out of the '*debris*' of the nest. In several female Platypi which we shot, eggs were found of the size of a large musket-ball and downwards, imperfectly formed however, that is, without the hard outer shell." ..... "An old female, which lived two weeks in captivity with a young one, being killed by accident on the fourteenth day after her capture, and being skinned while yet warm, it was observed that milk oozed through the fur on the stomach, though no teats were visible on the most minute inspection; but on proceeding with the operation *two canals* were discovered containing milk, and leading to a large *glandular apparatus.*"

These canals, however, as has been recently ascertained by minute dissection, are not single; but on each side there is a bundle of small capillary tubes,

united so as to form a short cord; these fine tubes open in a dark coloured circle on the skin, but which is covered by the fur, the glandular mass from which they proceed being of large size, compressed, extending nearly the whole length of the body, and lying immediately beneath the skin. From the collective evidence we have been able to obtain, as well as from some circumstances connected with its anatomy, we are strongly disposed to believe that the Ornithorhynchus is *ovoviviparous*, or, in other words, that the young are indeed hatched from eggs, but hatched before their birth, when they are extremely small, and that their nutriment is the fluid prepared in the large mammary gland, and which the mother has most probably the means of instilling into the mouth of its helpless offspring. Such is the mystery which yet hangs over this extraordinary creature; an animal which seems as if expressly made to show how multiform and inexhaustible are the resources of the almighty Creator; nor can we help remarking, that it appears to form a link between the more perfect mammalia and the feathered race, uniting the forms and characters of each in its own structure, so as to be in truth a *paradox*.

The food of this animal is said to consist of aquatic insects, worms, and perhaps seeds or other vegetable matter, which it searches for among the mud with its bill like a duck, separating them from the refuse by means of a line of small serrations along the edge. All attempts to rear it in captivity or bring it alive to Europe have as yet failed.

ORDER VII.—PACHYDERMATA.

Limbs four, and furnished with hoofed toes, variable in number; the stomach not constructed for ruminating, the body generally massive, and the skin thick.

The Edentata terminate that series of the mammalia as arranged by Cuvier, in which we find the feet furnished with true nails; and we may trace in the last order indications of a departure from this character, pointing out an alliance to that which succeeds and which begins a series of mammalia whose feet are constructed upon different principles. To this change we do not, however, pass suddenly, but are prepared for it, as we have said, by the hoof-like nails, and the total absence of tact or discrimination, as it regards the feet, and by the restricted action of the limbs, so conspicuous in the armadillo, the manis, and others of that singular group. Passing onwards, then, we leave the *unguiculata* (or nailed tribes) and enter upon the *ungulata* (or hoofed tribes,) whose feet have neither the slightest pretensions to the power of grasping or holding, nor to the least trace of the faculty of discrimination, but are encased more or less completely in horny hoofs; while at the same time the total absence of a collar-bone, in conjunction with the hinge-like structure of the joints of the limbs, adapts these organs simply and exclusively for support and progression, rendering them incapable of more complicated movements.

The food of a race of such animals is necessarily vegetable; though differing from each other in many points, they therefore offer much less decided contrasts than we find among the subjects of the six previous orders, forming only *two great divisions;* the one including such as *ruminate* or *chew the cud,* the other such as *do not ruminate.* The animals of the latter division or order will first occupy our attention: they are called *Pachydermata,* (*παχὺς,* thick, *δερμα,* skin,) from the massive thickness and solidity of the skin, a feature by which the most prominent species at least are strikingly characterized. Of the *genera* into which the *pachydermatous order* is subdivided, we first notice that which may be considered the most remarkable and interesting, namely, that of the ELEPHANT, (*Elephas,* LINN.) upon the characters of which we shall dwell as briefly as possible, but which will prove an introduction to the history of the animal itself. A *proboscis,* or flexible elongation of the nose, is certainly a leading feature; the *feet* have *five toes,* distinctly developed as regards the skeleton, but so "encrusted (to use the expression of Cuvier) in the callous skin which envelopes the foot," that their existence in the living animal is only indicated by the nails attached to this sort of hoof. The canine and incisor teeth are wanting; but in the bones, from which the incisor teeth arise in other animals, are two *tusks,* or, as the French more appropriately call them, "*défenses,*" which grow to an enormous size, and whose roots, implanted in immense sockets, appear to occupy the greater portion of the face. The skull, notwithstanding its great volume, is lighter than might

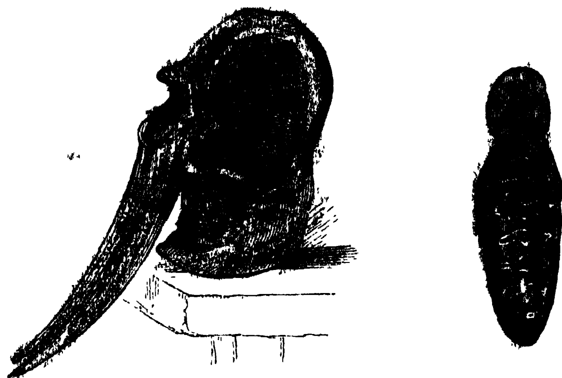
be expected, its walls consisting of two tables, between which a wide space intervenes, intersected by thin partitions into large cells and caverns, so as to form a honey-comb structure on a large scale, and void of regularity. The grinders bear a striking analogy in their structure to those of many of the *rodentia*, and consist of a certain number of *vertical laminæ*, each formed of *bone*, enveloped in *enamel*, compacted together by a third *substance* called *cortical*. These grinders are not permanent, as is the case with the second set in mammalia in general, but are changed six or eight times, succeeding each other not vertically, or in other words by the new one pushing up the old one, as is usual, but by the new one rising up behind the old one and pressing it forwards, so that as the latter wears down it is gradually pushed onwards by that which comes after it, and eventually takes its place; so that the Elephant has at one time *one*, at another time *two* on each side above or below. The number of laminæ of which these grinders are formed are fewer in the first set, and increased in that which succeeds. The tusks are changed also, but only *once*, the first, or milk-tusks, being shed between the first and second year, when not two inches in length. "In a month or two after this process, the permanent tusks cut the gum; these remain during the life of the animal, and are never again shed."

Cuvier has published a table of the length, diameter, and weight of the largest tusks, whether of the African or Indian Elephant, of which any account has been given. The largest on record was one sold at Amsterdam, which is recorded to have weighed three hundred

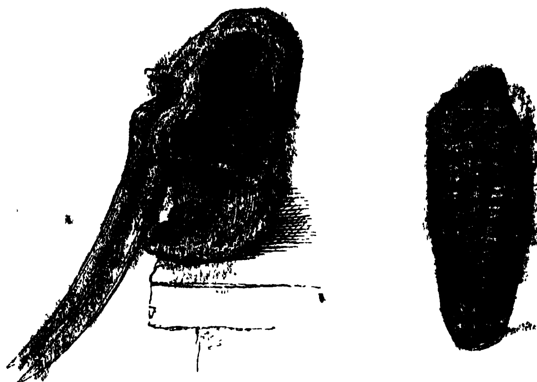
and fifty pounds. Several tusks measured by Eden were nine feet in length; and one described by Hartenfels in his *Elephantographia* exceeded fourteen feet; the largest in the Museum of Natural History at Paris is nearly seven feet in length, and about five inches and a half in diameter at the larger end. The size is not, however, a criterion of that of the body, as they continue to increase during life. The usual size of the finest brought to the India House from Bengal vary from seventy to a hundred pounds each, though some have weighed a hundred and fifty.

Two distinct species of Elephant are at present known. One a native of India, *(Elephas Indicus*, Cuv.) the other of Africa, *(Elephas Africanus*, Cuv.) The characteristic differences are briefly these: In the African the head is rounder, the tusks larger, the ears of enormous magnitude, covering the shoulders, and often used by the natives as a sort of truck upon which to drag various loads. The molars also in the African have their flat surfaces marked with large irregular lozenge-shaped ribands, passing from side to side, while in the Asiatic these transverse ribands are narrow, with indented edges, and fold upon each other in parallel lines. The differences which the skulls and teeth of these two species exhibit will at once be seen by the sketches on the next page.

The African Elephant appears to agree with its Asiatic relative in general habits, manners, and aptitude for the service of man; and, though the barbarous natives who now people Africa either look upon this lordly animal with dread, or hunt it for the sake of the



SKULL OF AFRICAN ELEPHANT, AND HIS MOLAR TOOTH.



SKULL OF ASIATIC ELEPHANT, AND HIS MOLAR TOOTH.

ivory, but never dream of the possibility of rendering it serviceable as a domestic quadruped, it was in ancient days extensively employed by the Carthaginians for purposes both civil and military. At the conclusion of the second Punic war, when Hannibal, whose army had been routed by the forces of Scipio, fled for refuge to Adrumetum (B. C. 201,) all the trained elephants of war which the Carthaginians possessed were given up to the Romans; nor is it improbable that, after the destruction of Carthage, the Elephant, though still hunted, ceased almost immediately to be sought as a beast of burden.

Having stated the principal grounds of difference between the two species, we shall proceed to consider these animals in a single point of view, or rather comment upon them indiscriminately, leaving the species to be ascertained by the attendant circumstances.

"Wisest of brutes, the half-reasoning Elephant!"

From the earliest epochs this gigantic creature has been rendered subservient to man, man whose mental energies have led him to devise the means of taming the strong and the swift, the quadruped or the bird, according to the advantages to be derived from the possession; but who himself, unless subdued by Divine grace, remains untamed, even while subjecting other animals to his will. The scriptures, Job xi. 12, describing the natural vanity and wickedness of the human heart, unwilling to the Divine commands, says, "Vain man would be wise, though man be born like a wild ass's colt." See also Ecc. iii. 18.

In searching among the writers of antiquity for light

on the time and circumstances connected with the first subjugation of the Elephant, we find ourselves lost in vague and uncertain traditions which refer to heroes or kings whose names, surviving through a lapse of years, have outlived the certain records of the actions which made them famous. Thus Bacchus, one of the conquerors of India, is said to have been the first who yoked the Elephant to a car; and Lucian states, that in the temple of Dea Syria were shown gems, *horns of elephants*, &c. which Bacchus brought from Ethiopia. About the year 450 B.C. Herodotus visited Babylon, where he saw elephants' teeth; and Ctesias, 401 B.C. "saw elephants at Babylon once throw down palm-trees at the bidding of their driver."

When Alexander the Great invaded India, elephants were employed by the princes of that empire as engines of war; indeed, that conqueror had met them previously in the army of Darius, which he routed at the battle of Arbela; but they proved a more formidable obstacle to him on the banks of the Hydaspes, when Porus resisted his passage with horsemen and chariots of battle, and a *multitude of enormous trained elephants*. Alexander having at length crossed the river by stratagem, a battle ensued, in which the elephants fought with the utmost intrepidity, and had nearly baffled by their prowess the skill of troops who never fought but to conquer. After a hard and desperate contest, covered with wounds, exhausted by pain, loss of blood, and their own exertions, they at last gave way, the greater number miserably perishing in the slaughter. About a century afterwards (280 B.C.) Pyrrhus, king of Epirus, brought elephants into Italy

against the Romans. The Romans appear at that time not to have been acquainted with these animals, at least personally; for the terror and astonishment they spread occasioned their loss of the battle of Heraclea. About four years after this battle, Pyrrhus again brought his elephants against the Romans; the surprise occasioned by their first appearance was over, and they had ceased to be formidable; Pyrrhus was vanquished, and his elephants did more damage among his own troops than among those of the Romans. Again, the Romans encountered them in the first Punic war, the armies of Africa bringing great multitudes from that country; and it is related that at the siege of Panormus (Palermo) a Carthaginian officer drew up one hundred and forty elephants in one line. In the second Punic war they were again brought forward, but to little purpose; and at a subsequent period the kings and Cesars of the seven-hilled city exhibited this animal in their triumphal processions, forced it into the brutal combats of the arena, compelled it to take part in exhibitions or feats of dexterity alien to its habits, inlayed their chariots, the ceilings of their rooms, and the beams of their chambers with its ivory, or contemplated their own statues elaborately wrought of the same rich material.

> "Non *ebur*, neque aureum
> Meâ renidet in domo lacunar."
>
> HORACE.' *Ode* xviii.

"Nor *ivory*, nor a golden roof-beam glitters in my house."

The scriptures make no distinct allusions to the Elephant until the time of David, when the 45th Psalm

mentions "*ivory palaces;*" but the Israelites were most likely unacquainted with the animal itself until its introduction at a later period into the armies of Greece and Rome, when its use in the wars of adjacent nations must have rendered it in some measure familiar. Its teeth, however, in the reign of Solomon, were imported by the vessels of Tarshish from India, with other productions of that country: "Once in three years came the navy of Tarshish, bringing gold, and silver, *ivory*, and apes, and peacocks," 1 Kings, x. 22; and in the 18th verse of the same chapter we find it recorded that "the king made a great *throne of ivory*, and overlaid it with the best gold." In Ezekiel xxvii. 6, we read of benches of *ivory* to be seen in Tyre; the 15th verse also stating "*horns of ivory*" being among the merchandise of that "proud city of the waters." After Judea became a Roman province, ivory and the animal which produced it were far from being rarities.

Notwithstanding the use of the Elephant on one or two occasions by the ancient Greeks and Romans as an arm of war, it cannot be reckoned among the military engines of Europe. Essentially eastern, the native chiefs of India have employed it in all international struggles from the earliest times to the present, the *howdah* on the elephant's back being the monarch's throne in battle and the rallying point for the army; the vacancy of this seat of honour for even a few minutes has led to irretrievable ruin. By the armies of Europe in the east the Elephant is much more sparingly brought into the field of combat, though in requisition for transporting baggage, cannon, and heavy

materials; indeed, as a beast of burden, it is used throughout India and China, nor less so, adorned with trappings of gold and embroidery, for the purpose of swelling the pomp and state of princes and nobles. There is, however, another end to which its powers have been called, namely, the revolting act of executing criminals or such as were doomed to death: to dash the victim to the ground with the trunk, stamp upon his chest with the foot, or impale him with the tusks, as the word of command might be, was a scene which the precincts of an eastern palace or a royal pavilion have too often exhibited.

The strength of the Elephant conjoined with its sagacity renders it a most efficient servant where extraordinary animal force is required, as in dragging ships, heavy stores, and ordnance. Captain Williamson, observing that "many of our most arduous military operations have been greatly indebted for their success to the sagacity, patience, and exertion of elephants," goes on to state that "when cannon require to be extricated from sloughs, the elephant placing his forehead on the muzzle, which when limbered is the rear of the piece, with an energy scarcely to be conceived will urge it through a bog from which hundreds of oxen or horses could not drag it; at other times lapping his trunk round the cannon, he will lift, while the cattle and men pull forwards. The native princes attach an elephant to each cannon to aid its progress in emergencies. For this purpose the animal is furnished with a thick leather pad covering the forehead to prevent its being injured."

The fondness of the Elephant for sweetmeats and

arrack (a spirituous liquor distilled from rice) is well known; and it is common to order a present of these delicacies as an encouragement or reward to any individual which has performed a task of difficulty. When made to understand that such reward will follow the completion of a laborious or dangerous duty, nothing can exceed the energy and determination displayed in the achieving it; but when the work is finished, it is no less unsafe than unwise not to complete the bargain, as the Elephant is keenly sensible of injustice, and apt to remember and revenge an injury. Kindness, however, makes him a willing servant, every word of encouragement (and the natives are accustomed to use persuasive or endearing epithets to him) is sensitively felt; indeed, the quickness of comprehension displayed by this noble animal appears as if the result of reasoning intellects. "I have myself," says an officer who has served in India, "seen the wife of a *mohout*, (for the followers often take their families with them to camp,) give a baby in charge to an Elephant while she went on some business, and have been highly amused in observing the sagacity and care of the unwieldy nurse." We might enlarge to an almost indefinite extent upon this part of our subject; let us, however, turn from the Elephant in captivity to contemplate him in his native forests.

> "Trampling his path through wood and brake
> And canes, which crackling fall before his way,
> And tassel-grass, whose silvery feathers play,
> O'ertopping the young trees,
> On comes the *Elephant*, to slake
> His thirst at noon in yon pellucid springs.
> Lo! from his trunk upturned, aloft he flings

The grateful shower; and now
Plucking the broad-leaved bough
Of yonder plume, with waving motion slow
Fanning the languid air,
He waves it to and fro." SOUTHEY.

This stately animal lives in herds or troops in remote and secluded districts, especially where large streams or rivers flowing through a wide and level tract are bordered by a luxuriant vegetation; there he passes a lengthened life of tranquil enjoyment, save when man invades his repose; and, alas! man has carried on a ruthless war against him from the earliest antiquity. Captured in India for the purposes of servitude; hunted in Africa for the sake of his ivory, he is driven farther and farther from the haunts of human society; still, however, he exists in multitudes in regions where man seldom ventures. Thus the mighty forests of Ceylon, Pegu, and Ava, and the unwholesome though fertile borders of the almost inaccessible rivers of Africa, constitute his strong hold. On the banks of the Fish-river this animal abounds; and Mr. Rose, who accompanied some elephant-hunters in South Africa, was told by an experienced hunter that he had seen as many as three thousand in a troop in that locality; indeed the circumjacent country appeared to have been the abode of elephants for ages, the paths or beaten roads made by them intersecting it in all directions.

"A herd of elephants," says Mr. Pringle, "browsing in majestic tranquillity amidst the wild magnificence of an African landscape is a very noble sight, and one of which I shall never forget the impression.

During my residence on the eastern frontier of the Cape colony, I accompanied a party of English officers on a little exploratory excursion into a tract of country then termed the Neutral Territory, immediately adjoining to the location of the Scottish settlers at Bavian's river. This territory, which comprises an irregular area of about two millions of acres, had remained for several years entirely without inhabitants; for its native possessors, the Caffres and Ghonaquas, had been expelled from it in 1819 by the colonial forces, and no other permanent inhabitants had yet been allowed to occupy it. The colonists were even forbidden to hunt in it under severe penalties, and in consequence of this the wild animals had resorted thither in considerable numbers.

"The upper part of this extensive tract into which we now penetrated is an exceedingly wild and bewildering region, broken into innumerable ravines, encumbered with rocks and precipices, and impenetrable woods and jungles, and surrounded on almost every side by lofty and sterile mountains. During our first day's journey, although we saw many herds of large game, such as quaghas, gnoos, hartebeests, koodoos, with a variety of smaller antelopes, there was no appearance of elephants; but in the course of the second day, as we pursued our route down the valley of the Koonap river, we became aware that a numerous troop of these gigantic animals had recently preceded, as foot-prints of all dimensions from eight to fifteen inches in diameter were every where visible; and in the swampy spots on the banks of the river it was evident that some of them had been luxuriously

enjoying themselves by rolling their unwieldly bulks in the ooze and mud. But it was in the groves and jungles that they had left the most striking proofs of their recent presence and peculiar habits. In many places paths had been trodden through the midst of dense thorny forests otherwise impenetrable. They appeared to have opened these paths with great judgment, always taking the best and shortest cut to the next open savanna or ford of the river; and in this way they were of the greatest use to us by pioneering our route through a most difficult and intricate country, never yet traversed by a wheel-carriage, and great part of it, indeed, inaccessible even on horseback, except for the aid of these powerful and sagacious animals. In such places (as the Hottentots assured me) the great bull elephants always march in the van, bursting through the jungle as a bullock would through a field of hops, treading down the thorny brushwood, and breaking with his proboscis the larger branches that obstruct his passage; the females and younger part of the herd follow in his wake in single file; and in this manner a path is cleared through the densest woods and forests, such as it would take the pioneers of an army no small labour to accomplish. Among the groves of mimosa trees, which were thinly sprinkled over the grassy meadows along the river's margin, the traces of the elephants were not less apparent. Immense numbers of these trees had been torn out of the ground and placed in an inverted position, in order to enable the animals to browse at their ease on the soft and juicy roots which form a favourite part of their food. I observed that in numerous

instances when the trees were of considerable size, the elephant had employed one of his tusks exactly as we should use a crow-bar, thrusting it under the roots to loosen their hold of the earth before he could tear them up with his proboscis. Many of the larger mimosas had resisted all these efforts; and, indeed, it is only after heavy rains, when the soil is soft and loose, that they can successfully attempt this operation.

"While we were admiring these and other indications of the elephant's strength and sagacity, we suddenly found ourselves, on issuing from a woody defile through one of the wild paths I have mentioned, in the midst of a numerous herd of these animals. None of them, however, were very close upon us; but they were seen scattered in little clumps over the bottom and sides of a valley two or three miles in length; some browsing on the succulent *speckboom (Postulacaria afra)* which clothed the skirts of the hills on either side; others at work among the mimosa trees sprinkled over the low and grassy savanna. As we proceeded cautiously onward, and some of these parties came more distinctly into view (consisting, apparently in many instances, of separate families, the male, the female, and the young of different sizes,) the gigantic magnitude of the leaders became more and more striking. The calm and stately tranquillity of their deportment too was remarkable. Though we were a band of about a dozen horsemen, including our Hottentot attendants, they seemed either not to observe or altogether to disregard our march down the valley."

The above extract presents so graphic a picture of the manners of this animal that we may leave this head and proceed to other points of consideration.

The Elephant is seldom bred in a state of captivity, as it is more advantageous in every respect to take a well grown animal from the wild herd, which after a short discipline is fit for service. It has indeed been asserted that the Elephant never breeds in captivity, but this opinion is erroneous. We have sufficient testimony to prove that such was the case in ancient Rome; and at the present day in India instances are by no means unfrequent.

The young Elephant is very playful, delighting to gambol and frolic, and displaying the exuberance of its buoyant feelings by a thousand antics. It does not arrive at maturity till between eighteen and twenty-four. It has been a question with some how the young Elephant received the mother's milk, since it drinks like the old ones, by drawing up the water into its trunk, which, when filled, it bends so as to place the extremity in its mouth, and then discharges the fluid into the throat. The little animal, however, sucks with the mouth, assisting itself by compressing the udder of the mother, which is placed between the fore legs, with its trunk.

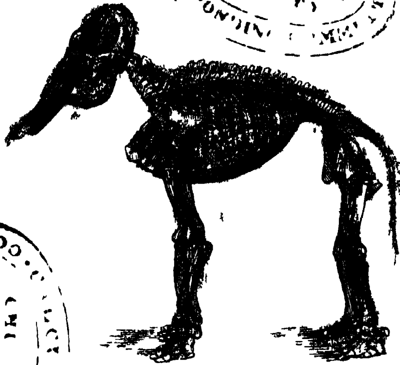
The modes of capturing the wild Elephant in India are various; the rudest and least successful (for the animal, aware of his weight, walks with habitual circumspection) is by means of a covered pit, into which he may fall; another mode is by decoy females, which artfully engage the attention of the victim (one of those large single males of the finest growth, called

goondah or *saun,* which wander alone,) while the hunters creep cautiously under him during the darkness of night and entwine a strong rope about his fore legs, which is then made fast to a tree, if one be near; if not, the hind legs are also secured. This being done, the females who have not only laboured to divert his attention, but actually assisted in fastening the cords, retire. He then discovers the state to which he is reduced: hampered by the ropes, he moves with great difficulty, the hunters following, and watching an opportunity of fastening the long ends left purposely trailing round a tree of sufficient strength. Thus made captive, he becomes completely furious, and exerts his utmost energies to break loose; should the cables give way, he rushes to the forest, where the hunters dare not venture to follow him thus infuriated; " but if adequately bound, he soon becomes exhausted with his own rage." He is then left to the further operation of hunger, till he is sufficiently subdued to be conducted under the escort of his treacherous friends to an appointed station. The elephant-hunts, systematically carried on by government, are described as a most magnificent spectacle. The plan is to surround a herd by a circle of men placed at a short distance from each other; the number required being three hundred and upwards. These, by noises of various kinds, and by fires lighted at different posts, drive the terrified animals into a body, which they endeavour to force into a sort of concealed pound or enclosure called *keddah,* made of strong timbers, and subdivided into large pens communicating with each other by means of gates, which are shut as the herd

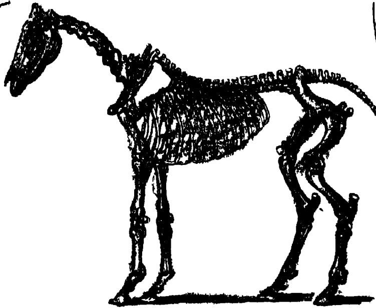
proceeds, from pen to pen, the last having a narrow outlet sufficient for the passage of only one elephant at a time, leading to a small and strongly secured enclosure, where, tempted by food, after some days of abstinence, an individual ventures to enter; retreat is immediately cut off; a scene of rage, despair, and violence succeeds, by which the animal is soon exhausted; he is then enveloped in a labyrinth of cords, and subjected to farther abstinence, till completely subdued he yields submissively to his fate. One by one the prisoners undergo the same process, and are removed under the guard of brethren, who had once passed a similar ordeal, to their destined stations.

We cannot, though we fear we have trespassed upon our limits, leave our present subject without glancing at some beautiful examples of mechanical art in the structure of the Elephant. The fore legs of this animal, as all must have observed, are more like pillars or the stem of an oak-tree than the limbs of a quadruped; strong and massive, they are fitted expressly for sustaining a weight of five thousand pounds, the average of the body; the hind limbs are equally massive, and it is remarkable that the thigh bone is not united to the socket of the hip-joint by that ligament which mammalia in general possess, (namely, *the ligamentum teres,)* a deficiency connected with the automaton style of motion so characteristic of the walk of the Elephant, which is totally devoid of that elastic bound and spring so much admired in the deer or the horse. If we examine the bones of the hinder limbs of these animals, we find each separate bone describing a considerable angle with the next; but in the Elephant

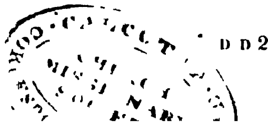
the angles thus formed are much less acute, the position of each bone approximating more closely to a perpendicular. Again, the horse (and it is the case with fleet-limbed animals generally) has the limb divided into three parts or joints, reckoning from the hip and excluding the bones of the pastern; the Elephant only two, so that the hind limbs in kneeling down are bent forwards as in man. All this, however, will be better understood by consulting the sketch on the opposite page, which also shows another point not to be overlooked, namely, the comparative shortness of the neck of the Elephant, in order that the heavy tusks, as well as weights taken up by the trunk, may be sustained with less strain upon the ligaments of the vertebræ, and less expense of muscular action. To counterbalance, as it were, the inconveniences arising from this contraction of the neck, which, even if the tusks were out of the way, would not admit of the application of the mouth to food on the ground, the Elephant is provided with an instrument of most admirable structure, we mean the trunk or proboscis. This instrument is composed entirely of bundles of muscular fibres, disposed in order transversely and longitudinally, and enclosing two canals. By their contraction or relaxation, these muscles are capable of drawing up, shooting out, or twisting in any direction the organ which they compose; indeed, the pliability and power it possesses may in some degree be conceived from the account of Cuvier, who has ascertained that the number of distinct muscles, each having its distinct action, is not far short of forty thousand; hence that union of strength and precision, force and



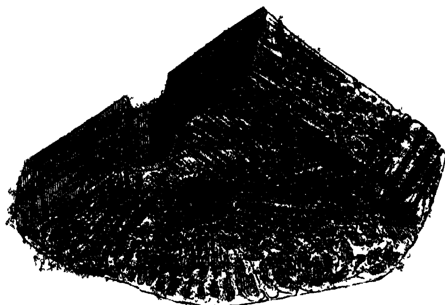
SKELETON OF THE ELEPHANT.



SKELETON OF THE HORSE.



address, which this exquisite piece of mechanism exhibits, and which so well proclaims the wisdom and skill of the Great Designer.



The canals of the proboscis are, as we have said, for the purpose of drawing up water, which is afterwards discharged into the throat, or over the body at pleasure; they are in fact two self-acting syringes. The proboscis itself is terminated by a flexible prolongation of the muscles, not unlike a finger, and indeed usually so called, the end of the trunk being concave, and the division between the two canals serving as a *point d'appui,* against which the finger can press so as to hold any small object with the greatest facility; with this little instrument it can pick up even a pin; and hence this noble creature is endowed with a faculty, (namely, that of examining objects with precision by the touch,) which, in conjunction with his native intelligence, has placed him among the first of gifted animals.

The fondness of the Elephant for bathing is well known: he swims the broadest rivers with ease, the

whole of the body being immersed, the end of the trunk alone being elevated above the water for the purpose of breathing. His sense of hearing is very delicate; his eye, though small, is full of intelligence and expression.

The usual height of the adult animal is from eight to ten feet, but instances of fifteen or sixteen have occasionally occurred. The East India Company's standard for serviceable animals is seven feet and upwards, measured at the shoulder, which is several inches lower than the back.

Here we close our account of this stately and interesting animal, which, as it is the most imposing of land mammalia, and no less distinguished for other peculiarities of structure and adaptation, may be naturally supposed to lead the mind more forcibly to Him whose might and wisdom are so strikingly set forth, and whose glory is seen in all.

The next genus to which we pass is hardly less interesting than that of the elephant, inasmuch as it contains an animal celebrated as the Behemoth of scripture, and which was once common through every branch of the Nile from Sennaar to the Delta.

The generic characters are these: toes on each foot four, nearly equal, and terminated by small hoofs; grinders six on each side above and below, the three anterior being conical, the three posterior crowned with points, which, from the detrition produced by mastication, present the form of *trefoil;* incisors in each jaw four, the superior being short, conical, and curved inwards, the inferior long, cylindrical, pointed, and projecting forwards, the two middle being not

only thicker but extending far beyond the others: the canine teeth are four, one on each side above and below, thick, massive, of a texture like ivory, and of enormous size; those of the upper jaw proceed from sockets largely developed, and curve regularly downwards, while those of the lower jaw project with a regular arch upwards so as to bring their ends in attrition against their opposite fellows. The contour of the body is low, massive, and clumsy; the skin naked; the head large; the muzzle swollen and protuberant; the tail short; the eyes and ears small. The stomach bears some degree of analogy to that of ruminating quadrupeds, being divided into many sacs. The diet is coarse vegetable matter, roots, and succulent grasses.

The genus HIPPOPOTAMUS, as thus characterized, furnishes only one species, (*Hippopotamus amphibius*, LINN.) an animal of enormous bulk, and exclusively found in Africa, where it frequents the larger rivers of the interior, concealing itself during the day among muddy swamps and reed-grown coverts, which it quits at night to wander in search of food. Night, indeed, appears the season of its activity; it then makes incursions into the cultivated fields of grain, committing sad havoc upon the labours of the semi-barbarous natives, not only by the quantity devoured, but by the trampling down of the stalks beneath its ponderous feet. The Hippopotamus, however, seldom ventures to any great distance from the river, its place of refuge and strong hold, to which it retreats upon any appearance of danger, and dives to the bottom, where it walks with ease, safe from the weapons of its pursuers;

not that it can remain long in the watery depths, it rises in fact every now and then to breathe, showing



the upper part of its enormous head above the surface, and instantaneously disappears, so as scarcely to afford a mark for the hunter, or give him time to take aim; hence the unsuccessful efforts which have so often occurred, for unless the head be hit point blank, the ball glances off without penetrating, and to fire below the water is useless.

This unwieldy and ferocious animal is gregarious in its habits, abounding in great numbers in secluded situations, where a scattered race of men fear it too much to attempt its destruction, or where the effective weapons of Europe are unknown or used with little skill.

Hippopotami are common at Sennaar, where the people appear to employ no decided means of checking their incursions otherwise than by digging pits, covered with reeds, into which they occasionally fall at night, becoming in the morning the victims of a horde of assailants. Here their hide is made into taper elastic whips called *korbadj*, and used generally throughout the north of Africa, but especially in Egypt, where they are the dread of every crouching peasant. Burckhardt informs us that the Hippopotamus is very common in Dongola. "It is," says he, "a dreadful plague there on account of its voracity and the want of means in the inhabitants to destroy it. It often descends the Nile as far as Sukkot. In 1812 several of them passed the Bahr el Hadjar, and made their appearance at Wady Halfa and Den, an occurrence unknown to the oldest inhabitants. One was killed by an Arab by a shot over the right eye; the peasants ate the flesh, and the skin and teeth were sold to a merchant of Sioutt. Another continued its course northward, and was seen beyond the cataract of Assouan, at Derau, one day's march north of that place."

Common in former days in Egypt, before modern weapons had taught it, as they have the elephant and the lion, to fear man as a foe before whom it must retire, it divided with the crocodile the empire of the Nile and its Delta; the Nile, over whose source mystery had flung a veil, and whose waters, while spreading the blessings of seed time and harvest throughout a country where millions greeted their overflow, at the same time teemed with productions monstrous and terrific, against which the spear and the arrow availed

not. Hence the Hippopotamus was well known to the Israelites of old; and in one of the most poetic passages of the Book of Job, chap. xl. it is adduced as a demonstration of the power of Him who is the giver of might and strength: "Behold now Behemoth, which I made with thee; he eateth grass as an ox. Lo now, his strength is in his loins, and his force is in the navel of his belly. He moveth his tail like a cedar; the sinews of his stones are wrapped together. His bones are as strong pieces of brass; his bones are like bars of iron. He is the chief of the ways of God: he that made him can make his sword to approach unto him. Surely the mountains bring him forth food, where all the beasts of the field play. He lieth under the shady trees, in the covert of the reed, and fens. The shady trees cover him with their shadow; the willows of the brook compass him about. Behold, he drinketh up a river, and hasteth not: he trusteth that he can draw up Jordan into his mouth. He taketh it with his eyes; his nose pierceth through snares." Job xl. 15—24.

In the same chapter, and the one following, we find the Behemoth and the Leviathan or crocodile associated together as inhabitants of the same region, pre-eminent among its productions, and affording parallel proofs of omnipotence. We are aware that some have considered the term Behemoth as referring to the elephant. Several expressions, however, clearly point out an animal of a different formation; for example: "he eateth *grass like an ox;*" the food of the elephant is roots and twigs, which he gathers with his trunk. Again, "He trusteth he can draw up Jordan into his mouth." The elephant draws up water with his trunk,

an instrument too remarkable to have been passed over by the sacred writer in the Book of Job; nor would he have alluded to the river Jordan in connexion with that animal, which is neither a native of Syria nor of Egypt; while on the other hand, as the Hippopotamus and the crocodile were both common on the Nile, they may have and most probably did in ancient days infest the lakes and rivers of the adjacent regions. Besides, the creature is painted as untameable, and not to be conquered by man: "He that made him can make his sword to approach him;" he only can subdue his wrath and power.

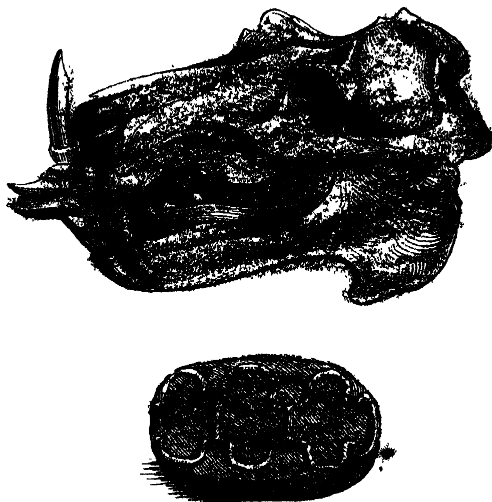
The Romans were well acquainted with the Hippopotamus, which, with other rare and singular animals, was exhibited in triumphal processions, or sacrificed in combats of the arena. Augustus celebrated his triumph over Cleopatra by an exhibition of this beast as a fit emblem of conquered Egypt.

The Hippopotamus is little inferior in bulk to the elephant; the body is totally devoid of grace, shapeless, and uncouth; the head is large, the mouth wide, and the muzzle covered with thick bristles; the limbs are massive and short, the belly almost touching the ground; the hide is dense and tough, and over the ribs is spread a deep layer of oily fat, which is reckoned a delicacy by the colonists of Southern Africa, and preserved by salting. The uniform colour is light Indian ink.

The enormous quantity of food necessary for the support of this monstrous beast may be conceived from the circumstance of Mr. Burchell finding six bushels of chewed grass in the stomach of one he examined. The usual pace of the Hippopotamus on

land is slow and heavy, though it can run with swiftness for a short distance; its home is, however, in the river, where it is perfectly at ease, swimming, diving, or walking at the bottom with the utmost facility. Here, if provoked or wounded, it is very formidable, attacking its aggressors with fury, and roaring at the same time so as to collect others to its assistance.

This animal produces one young at a birth, which is said to take to the water immediately. Our knowledge, however, of the habits of the Hippopotamus is still deficient. We subjoin a sketch of the skull of



this extraordinary creature, and of the surface of the first molar tooth of the lower jaw.

Our next group of *pachydermatous animals*, is that comprising the Swine, and several allied species, which, though forming one or two distinct genera, are all connected to each other by strong characters of affinity. The universal features are a coarse hide, mostly covered with bristles; an elongated muzzle, terminated by an abrupt snout, and adapted for rooting up the earth; small eyes; large and strong canine teeth; and feet, except in one genus, divided into four toes, of which the two middle are large and encased in strong hoofs, the lateral being shorter, so as scarcely to touch the ground.

The first genus, (*Sus*, LINN.) comprehends the true Swine: the incisors are six in each jaw, those of the lower being horizontal; the enormous canine teeth protrude from the mouth, having in both jaws an upward curve, and fitting upon each other; the molars are seven on each side, the anterior being compressed, the posterior tuberculous; toes four.

The most familiar example is that of the well known HOG, (*Sus scrofa*, LINN.) of which we need only say that it is the domesticated descendant of a race still wild in the larger forests of Europe, Asia, and the northern parts of Africa. The wild race may, however, be distinguished from our domesticated breed by the colour, which is a dark grizzled brown, by the greater length of limb, the small erect ears, the greater developement of the snout, and by a more bony appearance. It is easily reclaimed.

In his native forest the Wild Boar is a most formi-

dable animal, and when hard beset defends himself with great energy and resolution, his strength and tusks rendering him a terrific opponent. The hazardous chase of this animal was once a favourite diversion, and in Germany and the wooded regions of Europe is still eagerly followed. The hunting of the Wild Boar is also one of the sports of the East: often the hunter pays the forfeit of his rashness with his life, and the dogs that press the infuriated animal too closely are sure to fall; nor is the mounted horseman always safe from the impetuosity of his sudden attack.

The old males are said to live solitarily, never congregating with the general herd, which consists only of females and their young, for which the mothers fight with the utmost fury. The habits, the disposition, and the voracious appetite of the domesticated Hog have been proverbial from the earliest times to the present. Forbidden among the Jews as food, the very name of the animal sounded as an abomination in their ears; it was, however, kept for the sake of its flesh by other nations around Judea, and, as we may gather from various allusions by strangers or foreigners, within the territory of Judea also. "Now there was nigh unto the mountains a great herd of swine feeding," Mark v. 11; "and they that fed the swine fled," ver. 14.

The writers of the sacred volume have generally alluded to this animal in order to strengthen pictures of disgust, violence, or utter degradation, We have an example in point in the parable of the prodigal, Luke xv. where we find the young man represented as going into a far country, where he joined himself

to a citizen, who, to finish his degraded condition, a condition to which his sinful course had brought him, "sent him into his fields to feed swine." Again, in the 80th Psalm, the Boar is exhibited as an instrument of ravaging destruction. The church, beautifully figured as a vine brought out of Egypt, and preserved amidst the assaults of the heathen, is described as utterly desolate, its hedges broken down, while "the boar out of the wood doth waste it," ver. 13.

Besides the common Wild Boar, the genus includes several other species, especially from Africa, noted for their powers and ferocity. The most remarkable appears to be the MASKED WILD BOAR, *(Sus larvatus,* F. CUV.) an animal inhabiting Madagascar and the central regions of Africa, and rendered doubly hideous by the presence of a fleshy mass supported on a bony prominence arising beneath the eyes and stretching on towards the snout, so as to give the face a swollen and distorted appearance; its manners, except that it is said to be extremely ferocious, are those of the European species.

The Islands of the Indian Archipelago afford the BABIROUSSA, *(Sus Babirussa,)* distinguished from the rest of its genus by its lighter form, longer limbs, the narrow contour of its head, and especially by the long recurved canine teeth of the male, which bend back from the sides of the mouth like curling horns over the forehead, those of the upper jaw being the most developed.

The skin of the Babiroussa is black, naked, and

warty. If minutely examined, it is however found to be sparingly set with short bristly hairs, imperceptible even to a close by-stander. We notice this point the more particularly because, having examined a specimen lately brought in a preserved state to England, we are able to correct an erroneous idea of some authors, who state the animal to be covered with short woolly fur. On the contrary, the skin is coarse, and as naked as that of the hippopotamus. The contour of the animal is truly swinish. The recurved tusks of the upper jaw, instead of passing out between the lips, pierce through the skin half way between the eyes and the end of the snout, so as to appear like crooked horns, growing rather lower down than usual. The alveoli or sockets of these teeth turn upwards, covered by the upper lip and pressing against the skin of the upper surface of the snout, through which these canines have to cut their way in rising: the direction of the socket from which they spring influences the perpendicular line of their growth. It is difficult to ascertain the utility of instruments like these; the early writers supposed that they served as hooks, by means of which the animal rested the weight of its head on a branch during sleep; but this explanation is fabulous; nor will we venture a supposition, where observation can alone decide.

The ancients appear to have been acquainted with the present animal, as Pliny notices a wild boar found in India having horns on the forehead; and a writer of the sixth century mentions an Indian animal under the name of "swine deer," (χοῖρελαφος,) a term aptly designating the Babiroussa. It has never, we believe,

been brought alive to Europe; it is, however, capable of being domesticated, and its flesh, good and palatable, is well adapted for food.

Fond of the water, it swims with great ease and dexterity, crossing, it is said, without any difficulty the straits which intervene between neighbouring islands. Its food and manners are those of its race. A specimen exists in Mr. Steedman's Museum.

Separated from the true Swine, to which, however, in general appearance, disposition, and propensities, they are closely united, the PECCARIES constitute a separate genus under the name of *Dicotyles*. Their gait, their habits of rooting in the earth, their clothing of bristles, their grunt, their manner of clashing the teeth, and raising the mane when angry, together with their great susceptibility of dómestication, would almost seem to render the expediency of the separation questionable. They exhibit, however, points of difference which warrant the division: in the first place, although the grinders and incisor teeth resemble in form those of the swine, they differ in number, the incisors being *four* instead of *six* in the *upper jaw*, the molars in *each jaw six* instead of *seven* on each side; the tusks also do not take the character of those of the hog, turning up and projecting out of the mouth, but have the usual direction as in other animals. Again, the hind feet have only *three* toes, the external toe on each foot being wanting: added to this, the limbs are more slender, the head shorter, the snout longer than in the hog, and the tail is merely rudimentary, so as not to be visible. But the most decided character consists

in a large glandular apparatus on the middle of the loins, immediately below the skin, which pours out a fluid of disgusting odour, infecting the flesh when the animal is killed, and effectually barring the introduction of the species into our list of domestic quadrupeds.

Two species of Peccary are known, both natives of South America, where they frequent the thickest and most extensive forests, dwelling in holes of the earth or in hollow trees, and seldom approaching human habitations. Occasionally, however, they venture into cultivated grounds, and commit great havoc upon the plantations of maize or sugar-cane.

Of the two species, one is known as the COLLARED



PECCARY, or the *Patira, (Dicotyles torquatus,* CUV.;)

the other as the White-lipped Peccary, (*D. labiatus*, Cuv.) The Collared Peccary is generally met with in pairs, or at most in small families; its food consisting of roots and vegetables, which it searches for in the ground: it is itself the common prey of that tyrant of South American forests, the jaguar. It derives its name of "*collared*" from a line of white which passes from the fore part of the neck obliquely upwards to meet over the shoulders.

The White-lipped Peccary is larger, stronger, and more robust in all its proportions; it does not live in pairs, but in immense herds, consisting often of a thousand individuals, which traverse extensive districts, crossing rivers, and ravaging plantations in their march. Thus collected, they are not to be attacked with impunity, and even their foe the jaguar only ventures to seize a straggler, or to make an unexpected though fatal spring and rebound into a tree. Sonnini relates that while travelling in Guiana he was often surrounded by herds of Peccaries rendered desperate by the slaughter committed among them by the fire-arms of his party. Mounted upon a tree, so as to be safe from their assault, (the only mode of eluding their revenge,) he was at liberty to observe their motions, and notices their grunting by way of mutual encouragement; their mode of rubbing their snouts together in token of congratulation; and the rage and agitation displayed by their sparkling eyes and erected bristles as their ranks were thinned by the incessant firing, till at length the remnant were obliged to retreat in despair. The present species is at once distinguished by the absence of the collar, and by the under

lip, the sides of the mouth, and the top of the nose being white.

In addition to the vegetable food, upon which the Peccaries subsist, like the hog, they do not refuse animal diet, and wage a war of destruction upon lizards and serpents, which they devour with great avidity; nor would they, we suspect, refuse any offal that fell in their way.

Our next genus is that of *Rhinoceros*, (ῥιν, the nose, κερας, a horn.)

Africa, India, Java, and Sumatra, lands of the forest and jungle, where beneath a torrid sun nature assumes her most gigantic forms, are respectively the native regions of five distinct species composing the present genus.

Of bulk scarcely less than the elephant, of massive proportions and enormous strength, their *generic characters* may be thus summed up. The incisor teeth are either altogether wanting, or are four in each jaw; the canines are always wanting; the molars are seven on each side above and below; those of the upper jaw have a square surface presenting several projecting lines, and those of the lower an irregular crown with projecting eminences. The feet are divided into three toes; the skin is naked, thick, and solid; the bones forming the vaulted roof of the nose very strong, and supporting one or two solid horns adhering solely to the skin, and composed of longitudinal fibres, appearing on close inspection an agglutinated mass of hairs; these horns are indeed only a cutaneous secretion, the close-set pores of the skin sending forth multitudes of

fibres, which increase by the addition of fresh matter at the roots. Swampy situations near large rivers, and verdant plains, especially where water abounds, are the localities they frequent; herbs and the succulent shoots of shrubs form their food.

The records of antiquity often prove to us that our discoveries have been anticipated; so it is in the present instance. The ancients were not only acquainted with the one-horned Rhinoceros of India, *(Rh. Indicus,)* the species which alone in modern times, and that rarely, has been brought alive to Europe, but with one if not both of the two-horned African species; animals recently introduced to science, and of which one, the *Rh. Burchellii*, is as yet barely admitted into the catalogue of authentic mammalia.

Pompey appears to be the first who brought the Rhinoceros to Europe, one having graced his triumph; but at the festival of Ptolemy Philadelphus, king of Egypt, an Ethiopian species was exhibited among the rare animals brought forward on that occasion. After the death of Cleopatra, Augustus exposed two single-horned rhinocerosesand a hippopotamus to the slaughter of the arena.

Pausanias describes the two-horned species as a native of Africa under the name of the *Ethiopian Bull;* and we find the same species on some of the medals of the Emperor Domitian. From this time different species were from time to time exhibited in the reigns of Antoninus, Heliogabalus, Gordian, and others.

During the middle ages, when the western world was immersed in darkness, the remembrance of the Rhinoceros, and of many rare animals familiar to the

ancients, passed away; till, on the revival of letters, science began to dawn and men again inquired after those extraordinary productions of nature, not for the sake of swelling the pomp of a triumphal procession or the senseless and brutal slaughter of the arena, but in order to collect facts upon which science is to build; to examine the laws by which *life* is governed or species distributed, and so trace out, in as far as possible, that plan of order and unity which characterises the works of the Creator.

The INDIAN RHINOCEROS, *(Rh. Indicus,)* is, however, as we have said, the only species which has ever been brought alive to modern Europe; but, as all agree in habits and manners, our description will be general and comprehensive. The proportions of the Rhinoceros are extremely heavy, and its powers prodigious; scarcely less clumsy than the hippopotamus, its figure is not unlike that of a monstrous hog, to which it bears also a similarity in its voice, habits, temper, and gluttonous appetite. The limbs are short and thick; the ears moderate and erect; the eyes very small and deeply set, the sphere of vision being limited; but the hearing and smell are highly acute. Harmless and quiet if unprovoked, the roused Rhinoceros is one of the most formidable of adversaries, his attack being sudden and impetuous, and his fury blinding him to every fear. "Their smell," says Mr. Burchell, "is so keen and nice, that they know even at a great distance whether any man be coming towards them; and on the first suspicion of this take to flight. Therefore it is only by approaching them against the wind or

from the leeward that the hunter can ever expect to get within musket-shot. Yet in doing this he must move silently and cautiously, so as not to make the least noise in the bushes as he passes through them, otherwise their hearing is so exceedingly quick, that they would instantly take alarm and move far away to some more undisturbed spot. But the dangerous part of the business is, that when they are thus disturbed, they sometimes become furious, and take it into their head to pursue their enemy; and then if they once get sight of the hunter, it is impossible for him to escape, unless he possess a degree of coolness and presence of mind which in such a case is not always to be found. Yet if he will quietly wait till the enraged animal make a run at him, and then spring suddenly on one side to let it pass, he may gain time enough for reloading his gun before the Rhinoceros gets sight of him again, which, fortunately, it does slowly and with difficulty." The hide of the Rhinoceros is very thick and solid, but less so in the African animals, where it is smooth, than in the Asiatic species, where, besides having a tuberculous surface, it is disposed into large irregular folds especially about the shoulders and crupper. The edges of the ears and the extremity of the tail are fringed with bristles. The skin, dense as it is, is however far from being insensible; hence, to relieve itself of insects, by the stings of which it is tormented, the animal is fond of rolling and wallowing in the mud; the bath is also a luxury, in which it delights to indulge, and it swims with ease and vigour. Independently of the smoothness of the skin, both the African species are distinguished by double horns.

The best known of these African animals is the *Rh. Africanus*, or *bicornis*, though it has never been brought alive to Europe; the other, a recent discovery, *Rh. Burchellii*, is of enormous size: it was first seen in the plains of South Africa, in 24° S. lat. by Mr. Burchell; and the head of one shot was so heavy that, when separated from the neck, four men could not raise it from the ground, and eight were necessary to get it into a wagon.

Mr. Campbell, in his travels in South Africa, gives a somewhat similar account, evidently referring to the same species:—"The Rhinoceros shot by Jager on the preceding day, being cut up, were brought, the one in a wagon, the other on pack-oxen. ..... The common African Rhinoceros has a crooked horn resembling a cock's spur, which rises about nine or ten inches above the nose, and inclines backwards; immediately behind this is a short thick horn; but the head they brought had a straight horn projecting three feet from the forehead, about ten inches above the tip of the nose. ..... It has a small thick horny substance eight inches long immediately behind it, which can hardly be observed on the animal at the distance of a hundred yards. ..... The head resembled in size a nine-gallon cask, and measured three feet from the mouth to the ear, and being much larger than that of the one with the crooked horn, and which measured eleven feet in length (i. e. total length,) the animal itself must have been still larger and more formidable. ..... The natives, I afterwards heard, make from one horn four handles for their battle-axes." The portion

of the head brought to England was deposited in the Missionary Museum, Austin Friars, London.

Bruce, somewhat vaguely, describes another African Rhinoceros, a native of Abyssinia, and of large size, but of which we require further information.

Though intractable and subject in confinement to sudden paroxysms of ungovernable fury, the Rhinoceros is by no means utterly destitute of intelligence. Some years since we remember seeing an individual of the Asiatic species in a travelling menagerie, which was perfectly gentle, allowing itself to be touched, and ready to receive food from the hands of strangers. Bishop Heber observes, " At Lucknow there were five or six very large Rhinoceroses, the first animals of the kind I ever saw, and of which I found that prints and drawings had given me a very imperfect conception. They are more bulky animals, and of a darker colour than I had supposed, and the thickness of the folds of their impenetrable skin much surpasses all which I had expected. These at Lucknow are quiet gentle animals, except that one of them has a feud with horses. ..... I should conceive that they might be available to carry burdens as well as the elephant, except that, as their pace is still slower than his, their use could only be applicable to very great weights and very gentle travelling." In another passage he says, " In passing through the city I saw two very fine hunting tigers in silver chains, and a rhinoceros (the present of Lord Amherst to the Guicwar) which is so tame as to be ridden by a mahout quite as patiently as an elephant."

The Rhinoceros and the elephant are said to entertain feelings of mutual aversion. In Griffiths's notes on Cuvier's *Règne Animal* there is an account of a large rhinoceros, which, at the head of a herd of seven others, boldly attacked the elephants of a party of European gentlemen, and repeatedly brought them to the ground with the force of its blows. Mr. Williamson informs us that if a herd of elephants intrude suddenly upon this formidable beast, they retreat without hazarding an encounter. We may indeed easily conceive that the position and nature of its dreadful weapons, conjoined with the shortness of its stature, would give it great advantages in striking the under parts of its larger antagonist, an animal of too vast a bulk to turn with sufficient rapidity in order to avoid a succession of blows followed up with furious impetuosity.

Among the animals noticed in the scriptures there is one often introduced under the name of Reem or Unicorn. The most striking example that occurs is in Job xxxix. 10, 11; where, in allusion to its power and might, and the stubbornness of its nature, the question is asked, "Canst thou bind the unicorn with his band in the furrow? or will he harrow the valleys after thee? Wilt thou trust him, because his strength is great? or wilt thou leave thy labour to him?"

Notwithstanding some difficulties that envelope the subject, we cannot help thinking that the Rhinoceros is the animal intended; not the Indian species, though that has only one horn, but one of the African, probably that described by Mr. Burchell and Mr. Campbell, in which the length of the anterior horn renders the other of trifling importance. Bruce, it should be

remembered, speaks of a Rhinoceros in Abyssinia; and though we do not find the animal at present near the mouths of the Nile, nor along the northern line of Africa on the one side, or the north of Arabia, or Mesopotamia, on the other, any more than we do the hippopotamus, we should bear in mind that the combination of circumstances which has driven the latter, protected by the water as he is, to more remote localities, may and has most likely influenced the former also.

Some commentators have been inclined to suppose "creatures of the goat or ox kind" to be the unicorn of scripture, being guided apparently by the descriptions, by obsolete authors, of one-horned animals belonging to these tribes, or of "Indian horses and asses, which have but one horn." The Romans called the elephant the *Bull of Lucania*, and with less propriety than the Rhinoceros might be termed *the one-horned ass of India;* in fact, the *principles* of scientific nomenclature were little understood by the writers of antiquity. With respect to an animal of the ox or deer tribe having a single middle horn growing out of the centre of the forehead, we have to observe that the structure and mode of union between the bones of the skull in such animals render it a *physical impossibility.* The unicorn, as usually figured, is a creature like the sphinxes of Egyptian sculpture, or the centaurs of Grecian fable, existing only in the imagination. In the ruder sculptures upon many Egyptian monuments the *Antilope oryx of Gmelin,* an animal with straight horns, and nearly equal to a bull in size, is not unfrequently represented, and sometimes with one horn,

one fore leg, and one hind leg only, the bas-relief giving, as it were, a section of the body. But this two-horned antelope, however wild and difficult to take, could never be the unicorn of scripture, with which no animal coincides so well as the Rhinoceros; and it is not a little singular that the horn of the one-horned ass of India was said to possess properties which rendered it an antidote against poison, precisely as is supposed at the present day throughout the East with regard to the horn of the Rhinoceros.

We shall not dwell further on this topic, but just observe that the "*horn*" has been adopted as a symbol of power and prosperity, especially among eastern nations, from the earliest ages; the ancient heathens represented their Jupiter Ammon with horns; and, following up the idea, Michael Angelo, in his famous statue of Moses, sculptured the head as horned. "My horn," says the Psalmist, (my power, my elevated condition,) "shalt thou exalt like the *horn of a unicorn.*" The *cornucopia*, or horn of plenty, is yet a favourite emblem.

Our next genus, like that of rhinoceros, contains but a limited number of species; one, or at the most two, being all as yet discovered. The genus is that of *Hyrax*, HERMANN. comprehending the *Daman*, or *Coney* of scripture.

The classification of animals is founded upon the affinities of internal structure, which are indeed the only safe guides for the naturalist to follow. In accordance with this principle, the present genus (*Hyrax*) is assigned a place close to the rhinoceros; and yet

on a superficial view of the animals composing these two genera, we should hardly believe that there could exist any points of similarity between them. The huge naked rhinoceros presents on the one hand, and the little Daman, with its soft fur and active habits, the coney of the rock, on the other, a striking contrast. The older naturalists indeed placed the Daman among the animals of the *rodent order,* regarding its habits only, and overlooking or ignorant of its internal anatomy. Subsequent examinations have however established its true relationship.

The Damans, says Cuvier, are, in a certain sense, " rhinoceroses in miniature." With these ponderous creatures they agree in dentition, and the characters of the stomach, and alimentary canal.

We have fortunately had a recent opportunity of examining the living animal, and also the structure of its skeleton and internal organs after death. The molar teeth have irregular conical points, nearly agreeing with those of the rhinoceros; in the upper jaw there are two three-sided strong incisor teeth, elongated, bending slightly backwards, and sharp-pointed, with a considerable space between them, so as to make them look not unlike canines; in the under jaw there are four incisor teeth, flat, and projecting forwards, the two middle being separated by a slight interval: canine teeth are wanting. The feet are divided into four toes before and three behind, tipped with little rounded hoofs of slender horn, except the inner toe on each foot behind, which is furnished with a sort of hoof hooked like a claw. The muzzle and ears are short; the tail is a mere rudiment; the stomach has

the cardiac portion throughout its whole extent covered internally with a cuticular lining; and the large intestines, besides a considerable cœcum, have at some distance two large pointed sacs, not unlike the cœcal appendages of various birds. The ribs are twenty-one on each side.

The Daman inhabits Syria and the adjacent country, Abyssinia and the northern line of Africa, and also, (if the species be absolutely identical, which is perhaps questionable,) the Cape and southern Africa. The differences, however, between the CAPE DAMAN, *(Hyrax Capensis,)* and the SYRIAN, *(H. Syriacus,)* are so trifling, that Cuvier could establish no specific distinction.



As in ancient days, the rocks of Judea and the neighbouring region, are still a refuge "for the coneys." Associating together, they dwell in considerable numbers among the inaccessible rocks and

steep declivities of the mountains, coming forth to feed, it is said, during the day, but fleeing on any alarm to their holes, where their nest is prepared of leaves and grasses. Their food consists of roots and the vegetables of mountain districts.

The Daman stands somewhat low on the legs, being partially plantigrade; and its body is stout for its size, which hardly equals that of a hare. Active and lively it skips about with great agility, and its actions bespeak a sportive and playful disposition; indeed in captivity it soon becomes docile and affectionate. To behold this creature among the craggy and broken mountain scenery of the land of the Psalmist, where he noticed it himself, and recorded the goodness of God in providing a refuge for a defenceless animal surrounded with numerous enemies, the jackal, the hyæna, and the eagle, circumstances strongly reminding him of his own situation at that time, and which cannot but raise in the mind that train of reflections which led David to say, "O Lord, how manifold are thy works! in *wisdom* hast thou made them all." Solomon also, alluding to the instinctive wisdom which God has implanted in weak and feeble animals, in order that by their habits and modes of life they may be preserved from destruction, instances the Daman:—"The conies are but a feeble folk, yet make they their houses in the rocks." Prov. xxx. 26. Man, too, like the "conies," is weak and feeble, and there is need that his house be also built upon a Rock, to which he may flee in every danger, and find safety and protection—the Rock of ages. To return. The nature of the retreats or holes of the rock in which the Daman dwells renders the

capture of the animal difficult; at all events it is ever an acquisition, being scarce in museums, and rarely seen alive in Europe, where the scientific are ever ready to give it welcome.

We close the present section of the Pachydermata by the genus *Tapir*, GMELIN; of which for a long time one species only, a native of South America, was known to naturalists. Within a few years, however, the researches of Major Farquhar have introduced another to science, and from a very different quarter of the globe, namely, the deep forests of Sumatra, and the peninsula of Malacca. Of this species a preserved specimen brought over by the late Sir Stamford Raffles is deposited in the rich museum of the Zoological Society.

The generic characters are as follow. The molars, seven on each side above, and six below, have their crowns crossed by two transverse and straight ridges, at least until worn down by attrition; the incisors in each jaw are six; the canines two, separated from the molars by a wide interval; the nose is elongated into a short flexible sort of trunk; the feet have four toes before and three behind; the skin is dense, and thinly covered with short close hair.

The general aspect of the AMERICAN TAPIR, (*Tapir Americanus,)* bears a close resemblance to that of a hog, which animal it however far exceeds in size and power, being about five feet in length, with a heavy massive body, and a thick and muscular neck. Its colour, when adult, is a deep blackish brown; but

when young, besides being lighter, the cheeks are spotted with white, and several narrow bands of white, alternating with rows of small white spots, pass along each side of the body. The neck rises boldly from the head, arching to the shoulders, the elevation being caused by the extraordinary size of the ligament which runs from the occiput along the spinous processes of the vertebræ. The neck is surmounted by a stiff mane; the head is compressed laterally; the eyes are small; the skin very thick and tough, but covered with a thin and delicate *epidermis.*

The present animal is spread extensively over South America, but especially abounds between the tropics, living a solitary life amid the gloom of forests and along the course of rivers, neither injuring man nor beast. Inoffensive and gentle, the Tapir from his prodigious strength and the toughness of his hide is no easy prey to the native hunter, notwithstanding his poisoned arrows, nor even to the better armed sportsman of Europe. When attacked, the first thing the animal does, is to rush to the river, clearing a path through the intertwined underwood by dint of muscular exertion. Here it often happens that neither men nor dogs can follow. "The *lasso*" (a kind of noose) says the author of the '*Gardens, &c. delineated,*' "is seldom employed to take it, for it snaps asunder at a single effort a cord strong enough to interrupt a bull in the height of his headlong course." If followed to the water, it plunges in, and defends itself against its assailants, seizing the dogs with its teeth as they swim towards it, and inflicting the most desperate wounds. The water is not, however, its place of refuge

only; it is an element in which, like the rhinoceros, it takes the greatest delight, swimming and rolling about to enjoy the refreshing luxury of the bath.

Night is the season of activity for the Tapir; rousing up as the sun goes down, it issues from its secluded haunt, where it has passed the day in slumber, to ramble through the forest in search of food, which consists of roots, buds, young shoots, and wild fruits. In captivity its appetite, like that of the hog, is omnivorous, neither animal nor vegetable matters coming amiss.

In some parts of South America the Tapir is domesticated. M. Sonnini saw numerous individuals walking at liberty about the streets of Cayenne, whence they were accustomed to stroll into the neighbouring woods, returning at night to their home; nor were they by any means destitute of intelligence, but seemed fond of their masters, whom they not only recognized, but acknowledged by various tokens of attachment. We feel strongly disposed to consider with M. Sonnini, that the Tapir might, from its great strength and docility, be advantageously used as a beast of burden.

The short proboscis of this animal, though not capable of being employed like that more perfect organ of the elephant, is yet manifestly of great use in enabling it, by serving as a sort of hook, to pull down boughs or fruits, or to collect together and guide to its mouth roots or succulent plants or other substances on which it feeds.

The sight, hearing, and smell of the Tapir are very acute. It is much in request among the natives for its flesh, which, though coarse and dry, they regard as

excellent food. The skin is valuable from its toughness and density. Two beautiful specimens are living in the Gardens of the Zoological Society.

The INDIAN TAPIR, *(Tapir Indicus,)* is larger than the American, and its back and sides are of a grayish white abruptly edging the brown of the other parts; the neck is destitute of a mane. In its native habits it closely agrees with its distant congener, being equally inoffensive and docile. Its flesh also is eaten by the natives of Sumatra. The young, as is the case in the American species, differs in colour from the adult, being at the age of four or five months black, beautifully marked with spots and stripes of a fawn-colour above, and white below.

In addition to the two above-mentioned, a new species has been discovered in the Cordilleras of South America, covered with thick hair of a black colour, and with a more elongated snout. We have, however, little information at present respecting it.

We now come to the last section of the Pachydermata, containing the *solid-ungulous* mammalia, or such as have the bones of their toes enclosed in a single solid hoof. Of this section there is but one genus, namely, that of *Equus,* LINN. comprehending the Horse and its allies. In addition to the undivided hoof, the following may be numbered as generic characters. The incisors in each jaw are six, having in youth their broad edges channelled out into a cavity; the molars are six on each side, above and below, with square

crowns, sharply edged with enamel, in a crescent form: in the male, there are two canine teeth in the upper and two in the under jaw at a considerable distance from the molars. Of this genus, two species subjugated by man have submitted to his yoke, and have been so long domesticated, that it is a matter of some difficulty to trace out their true and natural origin.

The first species is the HORSE, (*Equus Caballus*, LINN.) This noble animal has in all ages been celebrated for his beauty, speed, strength, and spirit; qualities which have rendered him valuable to man savage as well as civilized. Amidst many descriptions of the Horse which occur in the classic pages of the ancients, there is one of extraordinary force and beauty in Virgil; but none equal that in the inspired Book of Job: "Hast thou given the horse strength? hast thou clothed his neck with thunder?" chap. xxxix. 19, a passage often paraphrased, but never successfully. The description of the Horse is truly sublime, "He paweth in the valley, and rejoiceth in his strength: he goeth on to meet the armed men. He mocketh at fear, and is not affrighted; neither turneth he back from the sword. The quiver rattleth against him, the glittering spear and the shield. He swalloweth the ground with fierceness and rage: neither believeth he that it is the sound of the trumpet. He saith among the trumpets, Ha, ha; and he smelleth the battle afar off, the thunder of the captains, and the shouting," ver. 21—25.

The Wild Horse, the origin, as is supposed, of the domesticated race, abounds in immense troops in the

vast plains of Great Tartary. There, free and unfettered, they scour the desert, each troop guided by one "mighty steed," to whom all appear to submit. Pallas describes a young mare caught in the country between the Jaïk and the Volga, which became very docile: its limbs were strong, the head large, the ears long, and lying back upon the occiput; the hoofs small, and somewhat pointed; the colour light bay, with a black flowing mane and tail.

In South America, the rich plains extending from La Plata to Paraguay are tenanted by herds of wild horses, the descendants of those originally introduced by the Spaniards on their first arrival. Thus this animal is an example of a species becoming by the agency of man the wild denizen of a country not its own. These wild horses of America when caught are easily subjugated, and valuable from their speed, hardiness, and strength. The method usually adopted to take them is by the *lasso,* a running noose at the end of a long leathern thong thrown with wonderful precision, and capable of bearing a sudden and violent strain.

Captain Head thus describes the manner of subduing these horses. "A man, mounted on a strong steady horse, threw his lasso over the neck of a young horse, and dragged him to the gate. For some time he was very unwilling to leave his comrades; but the moment he was forced from them, his first idea was to gallop away: however, the jerk of the lasso checked him in a most effectual manner. The peons now ran after him on foot, and threw the lasso over his four legs, just above the fetlocks, and, twitching it, they

pulled his legs from under him so suddenly, that I really thought the fall he got had killed him. In an instant a Gaucho was seated upon his head, and with his long knife in a few seconds he cut off the whole of the horse's mane, while another cut the hair from the end of the tail. This, they told me, is a mark that the horse has been once mounted. They then put a piece of hide into his mouth, to serve as a bit, and a strong hide-halter on his head. The Gaucho, who was to mount, arranged his spurs, which were unusually long and sharp, and, while two men held the animal by his ears, he put on the saddle, which he girthed extremely tight; he then caught hold of the horse's ear, and in an instant vaulted into the saddle; upon which the man, who was holding the horse by the halter, threw the end of it the rider, and from that moment no one seemed to take any further notice of him. The horse instantly began to jump, in a manner which made it very difficult for the rider to keep his seat, and quite different from the kick or plunge of an English horse: however, the Gaucho's spurs soon set him going, and off he galloped, doing every thing in his power to throw his rider. Another horse was immediately seized; and so quick was the operation, that twelve Gauchos were mounted in a space which, I think, hardly exceeded an hour."

The Horse is too familiar, and its habits and qualities too well known to warrant our dwelling upon them: its various breeds, the result of long domestication, its important services, its ungrateful treatment, and merciless death, are familiar to all.

The Ass, (*Equus asinus*, LINN.) next requires our notice. The origin of the Ass, like that of the horse, seems to be obscure and conjectural. The ancients mention a Wild Ass under the name of *onager*, but without specific details sufficient to determine the species. Herds of Wild Asses inhabit the plains of Tartary, as far as the confines of China, and are said to be swift and shy; but whether these be of the original stock is yet undetermined. It is indeed a singular fact that the origin of all our domesticated quadrupeds, from the dog to the sheep, is enveloped in uncertainty, such modifications have the arts of man and acquired habits, continued for a long series of ages, been able to effect.

From time immemorial the Ass in eastern climes has been the slave of man; but in the northern latitudes of Europe its introduction may be considered as comparatively recent, being unknown there in the time of Aristotle; and now, strong, patient, and hardy as it is in our unfriendly clime, still it is not the animal it is found to be in the southern states of Europe, and more especially in the east. Here it is dull and slow; there it is large, handsome, and spirited, and in common use for the saddle. In ancient times it was indeed more employed by the Orientals for common purposes than the horse, the latter animal being deemed fitter for war and spectacles of pomp and state; besides which, the ancients, who knew not the art of shoeing the horse's hoof with iron, found it more destructible and more easily injured by travel on hard roads and by long journeys than the harder hoof

of the Ass. The hoofs of horses were generally defended by sandals of thick close felt.

In conjunction with the ox, universally employed as a beast of draught by the ancients, we find the Ass perpetually alluded to in the sacred writings. "The ox knoweth his owner, and the ass his master's crib," Isa. i. 3. Again, "Whose ox or whose ass have I taken?" 1 Sam. xii. 3. In the Commandments, Exodus xx. we also find the ox and the ass associated.

In Genesis xxii. 3, it is said that "Abraham rose up early in the morning, and saddled his ass." Balaam was riding on his ass to meet Balak, when the angel of the Lord stood in the way, Our Saviour too, it will be remembered, honoured this animal, when the appointed time was come that he should lay down his life as a ransom for many, by using it to carry him into Jerusalem, amidst the hosannas of a multitude, that soon after cried, "Away with him! crucify him!"



Thus universally employed, the Ass was valuable, and constituted an important part of the possessions of the Patriarchs; "Abram had he-asses, and she-asses, and camels;" "Jacob had much cattle, camels, and

asses." And it is said of Job that he had, besides other animals, "five hundred yoke of oxen and five hundred she-asses;" which, after his trials, were increased, to a "thousand yoke of oxen and a thousand she-asses."

We need not multiply instances of the use of this animal and the value set upon it in ancient days. In our "christian land" it leads a life of scanty fare and ill treatment, ended by a premature death; and yet for the purposes of a poor industrious man we know of no beast of burden so truly serviceable, nor one with more substantial claims upon his gratitude.

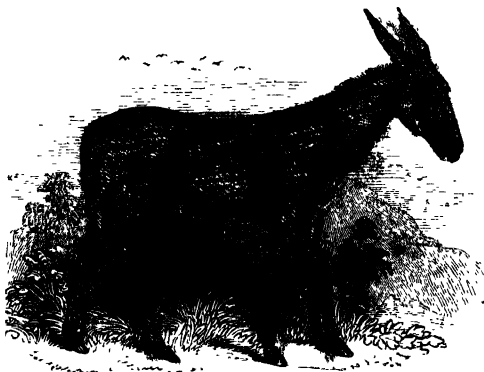
The deserts of Tartary present an animal which has never yet acknowledged man to be its master; but which "snuffeth up the wind at its pleasure;" it is the Dziggtai, or Wild Ass of the scriptures.

"Who hath sent out the wild ass free? Or who hath loosed the bands of the wild ass? Whose house I have made the wilderness, and the barren land his dwellings. He scorneth the multitude of the city, neither regardeth he the crying of the driver. The range of the mountains is his pasture, and he searcheth after every living thing." Job xxxix. 5—8.

Intermediate in size between the horse and the ass, the Dziggtai is, in the extreme, wild and untameable. In the proportions of its limbs it exhibits the lightness and elegance of the stag combined with the power of great muscular exertion. "It literally runs," says an able writer, "with the rapidity of lightning, carrying its head erect, and snuffing up the wind. It easily

escapes the hunters, for the fleetest coursers that ever scoured the desert would in vain attempt to overtake it. Its air is wild and fiery, expressive of its unbounded energy and tameless character."

Like the wild horse, this freeborn of the desert lives in troops, over each of which there is a leader or chief, on whom the movements of the rest depend. Ever alive to the appearance of danger, conducted by their leader, they wheel round and advance towards the object of fear, as if to scrutinize it more attentively, and await his signal, three bounds in a circle, and off they skim over the desert like the wind, leaving every enemy far behind.



In the Gardens of the Zoological Society there is a beautiful specimen of this elegant creature: its colour is a pale bay or cream, with a black dorsal line.

The flesh of this animal is accounted a delicacy by

the Mongols, who sometimes contrive to shoot the leader, when the troop is thrown into confusion, so that several fall before they take to flight.

The word *Dziggtai,* which is spelled in various ways, is said to have a reference, in the Mongol language, to the *large ears* which in this animal exceed those of the horse. It is a native of oriental Tartary and the adjacent wild country of China and Persia.

We must now pass over to Africa, for there do we find the remaining species of this genus, namely, the Zebra, confined to the mountains, for which locality its hoofs are expressly formed; the Quagga, and a new species, Burchell's Zebra, both natives of the southern plains.

Like the Dziggtai, the ZEBRA, *(Equus Zebra,* LIN.; *E. montanus,* BURCHELL,) may be said never to have been subdued "by bit and bridle;" for though perhaps not utterly unsusceptible of domestication, few attempts have been at all successful. Fierce, strong, fleet, and beautiful, it ever commands our admiration; to describe it would be superfluous. We may, however, observe that in the male the ground-colour is yellowish fawn, in the female white, over which the black stripes are disposed with exquisite symmetry. The mountain districts of Africa, from Abyssinia to the south, are its habitat, where it often falls a prey to the lion, and often to the savage natives who regard its flesh as a delicacy.

The Zebra much more resembles the ass in form

and disposition than do the other two species, which in their general contour more resemble the horse, and have a more docile and tractable disposition.

The QUAGGA, *(Equus Quagga,)* is often seen in herds of hundreds, traversing the sultry plains of Southern Africa, but never associating either with the zebra or the following species. It is much less beautifully marked than the zebra, and its colours are less distinct. The shoulders are dark brown with whitish transverse bars; the hinder parts are light brown, fading off to white beneath. It is far from being improbable that this animal may at no very distant period be added to the list of animals in a state of domesticated subjection to man; in its native regions, where temperature and food are congenial, it would doubtless reward by its services the trouble taken by intelligent settlers from Europe in reclaiming it, and might ultimately be universally distributed. The name of this animal expresses the sound of its voice, which has some resemblance to the barking of a dog. The Caffres and Bushmen consider it as delicious food; nor is it less liked by the lion: man and beast are both alike its enemy.

The next and last species, BURCHELL'S ZEBRA, *(Equus Buchellii,)* like the quagga, is a native of the plains, inhabiting in small bands the flat country north of the Cape, and stretching into the interior. It is a strong and muscular animal, with bony limbs, and might well serve as a beast of burden. Its head,

neck, shoulders, and back, are covered with alternate stripes of black and white, the black becoming fainter on the haunches, and losing itself on the under parts; the nose is brown; the legs are white, with obscure traces of black markings.

We thus close the order Pachydermata, a race of animals calculated to impress us with their forms, their magnitude, and their habits. The gigantic elephant, the clumsy hippopotamus, the wild ass careering through the desert, are all evidences of a mightier power, a Power in whom they live, and move, and breathe; and by all their various characteristics they show forth his glory.

The genus *Equus*, or the solidungulous family, is that which conducts to the next order, an order in which we find the toes inclosed in hoofs, solid indeed, but divided, a circumstance which, united with other characters depending not only upon outward form, but upon organic structure, constitutes it one of the most natural and best determined of the class mammalia.



ORDER VIII.—RUMINANTIA.

Limbs four, and terminating in two hoofed toes, (the feet being called cloven;) the teeth usually of two, but sometimes of three kinds, the stomach constructed for ruminating.

We now arrive at an order containing various races of animals, all preeminently useful to man. Other orders may contribute a few isolated species, of whose habits and instincts he has availed himself in the furtherance of his plans and purposes, and which acknowledge him as a master; but here we find a whole order created with an express design to promote his immediate welfare. All are valuable, as supplying him with food; from many he derives his clothing; others labour for him as beasts of burden; their flesh, their hides, their horns, their hoofs, are all valuable; and those which he has more exclusively taken under his protection repay him a thousand fold for the care they demand at his hands. With this Order the prosperity of the human race is intimately connected: peaceful tenants of the earth, they add by their presence fresh and more cheering beauties to vale and lawn, and mountain, and impart life and spirit to the scenery of nature. Need we say that we allude to the ox, the sheep, the deer, the camel; in fact the whole circle of ruminating mammalia. While historians, sages, and poets have borne testimony to their intrinsic value, while they form a portion of the national

wealth of every kingdom, while they conduce essentially to the progress of arts and civilization, and to the necessaries of life, ought we to forget from whose hands man has received the boon? He who giveth and withholdeth has said, "The cattle upon a thousand hills are mine;" the "earth is his, and the fullness thereof."

No order in the whole range of the mammalia is more natural or better defined than the present; the animals composing it exhibit in the general model upon which they are built, and in their internal structure, striking and well marked affinities. Except in the two limited genera of the *Camel* and the *Llama,* the under jaw alone is furnished with incisor teeth, generally eight in number; but the place of incisor teeth in the upper jaw is supplied by a callous pad, against which those of the lower press. In most genera the canine teeth are altogether wanting, a wide space intervening unoccupied between the incisor teeth and the grinders; these latter are large and strong, with flat irregular crowns, adapted for grinding, like millstones, the hard grain and coarse vegetable fibres upon which the animals feed. Hence the condyles, or articulating surfaces of the lower jaw, together with the cavity in the temporal bones into which they are fitted, are so constructed as to permit of a free grinding motion from side to side, an action all our readers have no doubt observed in the cow or sheep while feeding. The feet are each terminated by two toes encased in hoofs, having the internal sides flattened and brought in close contact together, so as

to appear a single hoof longitudinally cloven; behind these are often two rudimentary vestiges of lateral toes. The two bones of the matacarpus and the metatarsus are united into one under the name of the canron bone; but, as Cuvier observes, whenever a cloven-footed animal manifests in the arrangement of its teeth some tendency to approach the hoofed animals which are not ruminant, (such as the hog, rhinoceros, &c.) " it also manifests a similar tendency in the arrangement of its feet. Thus the Camels, which have canine teeth, and even two or four incisors in the upper jaw, have an additional bone in the tarsus, because their scaphoid bone is not united to the cuboid, and they have very small hoofs with corresponding phalanges. The musk animals, whose canine teeth are much developed, have a distinct fibula along the whole length of their tibia; while the other cloven footed animals have, in place of a fibula, only a small bone articulated at the lower end of the tibia. There is, therefore, a constant harmony between two organs apparently having no connexion; and the gradations of their forms preserve an uninterrupted correspondence even in those cases in which we cannot account for their relations. Such is the mysterious harmony of nature, and so orderly, systematic, and minute is the plan upon which the Almighty has constructed the animal mechanism.

" He," says the illustrious philosopher just quoted, " who observes only the print of a cloven foot may conclude that the animal which left this impression ruminates; and this conclusion is quite as certain as any other in physics or in moral philosophy." Hence

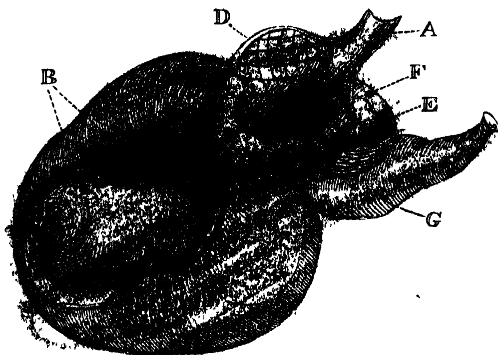
the propriety of the title by which this Order is distinguished—*Ruminantia,* ruminating animals. To understand what is precisely meant by ruminating, or the action of chewing the cud, we must explain the curious plan upon which the stomach is constructed, and which, if understood, will at once give the reader a clear conception of the operation.

The stomach, then, is divided into four distinct cavities, chambers, or lesser stomachs: the *first* and the largest is the paunch, "*la panse*" of the French, (rumen or ventriculus;) the *second,* the hood, "*le bonnet,*" (reticulum;) the *third,* the many-plies, "*le feuillet,*" (omasus;) the *fourth,* the rud, "*la caillette,* (abomasus.)

The large paunch, or first cavity, serves as a receptacle for the grass or herbage coarsely ground by the first mastication; from this the grass passes gradually into the second or reticulated cavity, the sides of which present a honeycomb structure by folds or laminæ intersecting each other; this cavity is very small, and of a globular form, and in it, the mass entering by degrees, is compressed, divided, and compacted into small balls, which by its action and that of the gullet, (with which, as well as the paunch, it communicates,) are returned by a voluntary effort into the mouth to undergo the second process of mastication. During this operation the animal reposes at ease, until the meal it has taken has been all subjected to the like process. Each ball, as soon as it is reground, is swallowed directly into the third stomach, the omasus, (called feuillet by the French, because its internal surface presents a series of longitudinal lami-

næ like the leaves of a book;) from this the mass then passes to the fourth, or abomasus, the true organ of digestion and analogous to the simple stomachs of ordinary animals. The object of this elaborate process is that the food, which is coarse, may be prepared so as to yield every particle of nutriment it contains. Besides being thus elaborated, it has to pass through an enormous alimentary canal, the lacteals opening on the inner surface of which absorb every nutritive atom as the mass proceeds. This increased volume of the alimentary canal is indeed a characteristic in the organization of every vegetable-eating quadruped.

In our annexed sketch, which represents a section of the stomach of an antelope, so as to display its



internal mechanism, we see the gullet, A, which is laid open, expanding into the paunch, B, partially divided by a muscular wall or septum; the paunch

we see separated from the second stomach, the reticulum, by a valve, C, interposing between them, so as to admit the food only to pass gradually and gently by the vermiform motion of the paunch into this reticulum, D, laid open so as to show its internal structure. In ruminating animals, as the camel, destined to inhabit localities where water is scarce, or where often it cannot be procured for days together, the cells of this part are large and deep, (in addition to which there is a peculiar cellular apparatus of the paunch in such animals;) but where the animal is destined to inhabit a well watered locality they are slight and rudimentary. Now how happens it that the food passes first into the paunch, and not into the other cavities of this compound stomach? The valvular apparatus of the reticulum prevents its entrance there. But why not into the third or plicated cavity, E, into which, after remastication, it is immediately conducted when swallowed the second time? If we look again at the gullet, as seen divided in our sketch, we may observe a fold running down and walling in an orifice, F. This is the orifice of the omasus. Now the fold which begins at the lower part of the gullet not only directs the course of the food on its first mastication, but the orifice itself is closed against the food which has only undergone its first process, and would refuse to let any portion pass; for the fibres of the muscular layer surrounding it are of such a nature and have their irritability so modified as to contract upon the application of crude vegetable matter; when, however, this matter has been elaborated in the reti-

culum and again masticated, this orifice expands and is brought by the action of the muscular fibres of the stomach higher up into the gullet to receive the then welcome mass. Of this third stomach, or omasus, we have removed a portion of the coat to show its internal laminated structure. The use of this stomach seems to be to absorb from the reswallowed food all its moisture, and compress it as dry as possible previously to transmitting it in this state to the fourth or true digesting stomach, the abomasus, G, in order that the gastric juice may be as little diluted as possible, and therefore the better qualified to act upon such a material.

The third stomach, or omasus, is the least essential. In ruminants capable of enduring long thirst and feeding upon dry shrubs, as the Camel and the Llama, it cannot be said properly to exist, the opening leading directly into the abomasus. In the genus Moschus, or that of the musk deer, approaching the camels in dentition, it is very small.

The reader must make allowance for a great portion of the stomach cut away, in order to show its interior, and fill up the deficiences in his own mind. The fourth or true stomach is unopened.

While the ruminating animal is young and lives upon its mother's milk, the process of rumination does not take place: the fourth stomach is then the largest; and the paunch, contracted and small, has yet to become developed, a change which goes on gradually in proportion as the young animal betakes itself to an herbaceous diet.

The fat of ruminating animals has the property of

hardening as it cools, and is distinguished by the name of suet.

Some of the genera of the present Order have horns, as the ox and the antelope; others antlers,* or osseous projections, in the male, arising from the frontal bones, and yearly shed and renewed; and a few, elongated canine teeth, which seem to take the place of horns, these being wanting.

The first genus to be noticed is one which connects the present Order in many points with that which preceded, and forms the passage from the one to the other; it is that of the CAMEL, (*Camelus*, LINN.) The following are its characters. Both horns and antlers are wanting; but in compensation there are two powerful canine teeth in each jaw; the upper jaw has also two incisors, the lower six; the molars are six on each side above, and five below. The scaphoid and cuboid bones of the tarsus (or hind knee joint, as it is erroneously called,) are separate. The toes, instead of presenting the true cloven figure, are united underneath by a common sole or pad, and only tipped with small horny hoofs. The upper lip is cleft and swollen; the neck long; the orbits of the eyes are projecting; the third stomach, or laminated omasus, is wanting; and the paunch is furnished with a large congeries of cells, in which it would appear that water is retained

* The antlers of the stag are often, though improperly, called *horns;* but there is nothing of horn about them, and the word is solely applicable to those of oxen, sheep, and antelopes. The French always observe the distinction, calling the latter "*cornes*," the former "*bois*."

to serve the wants of the system in case of extreme necessity.

Of the Camel two species alone are known, and both in a state of domestication. These are, first, the BACTRIAN CAMEL, (*Camelus Bactrianus,*) with two hunches, limited to the central portions of Asia, Persia, Thibet, Turkestan, Tartary, and China; and, secondly, the ARABIAN CAMEL, (*Camelus Dromedarius,*) with one hunch, extending from India to Arabia and along the northern regions of Africa. To this latter the name of Dromedary is commonly applied, though not very correctly, the word being of Greek origin, and referring, in allusion to their rapidity, to the light fleet breeds of both species, used for the purposes of riding, and upon which it is customary to send messengers when the distance to be travelled is great, and dispatch necessary. The swift breed of the Arabian or one-humped Camel is called *Maherry*, or *el Heirie*, in the Arabian desert, and *Subayee* in the empire of Morocco. "When thou shalt meet a *heirie* and say to the rider, *Salem alic* (Peace be between us,) ere he shall have answered thee, *Alic salem*, (There is peace between us,) he will be far off and nearly out of sight, for his swiftness is like the wind," is the figurative language of the Arab to indicate the fleetness of the heirie. The extraordinary length of journeys, and the short space of time in which they are performed by animals of this breed, are almost incredible. Seventy or even a hundred miles in the twenty-four hours, and kept on in the same ratio for successive days, is by no means an unusual rate of travelling; and it is said that six

hundred and thirty miles have been performed in five days.

In China there is also a swift breed, to which is given the poetical title of "the Camel with the feet of the wind."

The history of few animals is more interesting than that of the Camel. Serving man under circumstances which would render the horse, the ox, or the elephant comparatively useless; its congenial dwelling-place the wide-spread desert; its food the thorny shrubs and coarse herbage which rise from oases, scattered far apart like islands in an ocean of arid sand, we find this patient creature accompanying the Arab in his desultory wanderings, or transporting in associate bands, called caravans, the commodities and merchandise of one nation across an almost interminable waste to exchange for those of another; a waste which, but for this "ship of the desert," would be a more effectual barrier to their intercourse than the sea, or chains of Alpine mountains. Surely, then, the structure of an animal constituted for such a mode of life must offer many peculiarities, many traces of design. Our time will not be lost if we glance at the general plan upon which its Creator has fashioned it.

The Camel, as we have said, exhibits in its dental formula the most remarkable exception to the general rule of the Order, having sharp and powerful canines above and below, and especially two strong pointed incisors in the upper jaw placed laterally, so as to correspond with the last incisors on each side of the lower. And why this deviation? The Camel does not feed in verdant meadows, nor crop the tender

herbage of a well cultivated and luxuriant pasturage; such favoured spots are for the ox, the deer, the antelope; but it browses on hard dry shrubs, and thorny branches of considerable thickness, which require the action of powerful teeth to bite off, as well as to masticate. To aid in the procuring of this hard fare the upper lip is cleft, and each portion is separately moveable, so as in fact to give an imperfect organ of prehension capable of holding towards the mouth, or drawing to the teeth the twigs or branches it selects. Sometimes, however, the Camel meets with what to it is a luxurious diet, date-leaves and aromatic shrubs; and these it can nip off with its divided lip without the agency of other instruments.

The eye of the Camel is large and prominent, so that it can take in an extensive range, and its vision is very keen; but it cannot look upward, for, in the horizontal position in which the head is always carried, the brow overhangs the orb, so as to shield it from the direct glare of the sun in a burning sky; a wise and merciful provision!

Who has not heard of the Semoum, or hot wind of the desert, blowing from the south-east, and carrying along with it dense yellow clouds of sand, impeding respiration, and often suffocating the traveller to death? Even the lighter winds as they pass drive the sands in volumes before them. The fine particles with which the air is loaded would to animals with wide and open nostrils occasion the greatest suffering; but the nostrils of the Camel are in the form of slits, which it can close or open at will; and thus, by respiring gently and gradually, it has the power of excluding the suffo-

cating mass. Of all its senses, though its hearing is very delicate, and it delights in the sound of bells or the cheering song of its driver, that of smell is the most acute. When exhausted with fatigue and the agony of unquenched thirst, the pilgrim sees but the *mirage*,* a mockery of water, often pursued, but ever deluding his hopes, (fit emblem of all earthly vanities,) and gives way to the misery of despair; snuffing the gale the Camel is the first to bid hope revive once more, the first to indicate by signs of dumb eloquence, that water, water more precious than the most costly wines is soon to be obtained.

The Camel is, however, of all mammalia, the best qualified for enduring long continued thirst; frugal, temperate, and hardy, a few dates, a little meal, a cake of barley, and the shrubs of the desert, suffice as food in its journeys; water is carried in skins for its use and that of its master, and is doled out daily with a careful hand; but it often happens that the supply

* During the whole day's march," says Burckhardt, " we were surrounded on all sides by lakes of mirage, called by the Arabs *Serab*. Its colour was of the purest azure, and so clear that the shadows of the mountains which bordered the horizon were reflected in it with the greatest precision, and the delusion of its being a sheet of water was thus rendered still more perfect. I had often seen the mirage in Syria and Egypt, but always found it of a whitish colour, rather resembling a morning mist, seldom lying steady on the plain, but in continual vibration; but here it was very different, and had the most perfect resemblance to water...... There were at one time about a dozen of these false lakes around us, each separated from the other, and for the most part on the low grounds."—*Nubia*, p. 193.

The mirage is a phenomenon depending most probably upon the refraction of the rays of the sun passing through an atmosphere in contact with the heated surface of the sand; the drier the air and earth, the more perfect is the delusion.

falls short before fresh can be obtained, so that the traveller, with barely enough for himself, must perish if he supply his beast; and too often it fails altogether. The Camel, patient and enduring, and the only earthly chance of escape at such a crisis, has within a reservoir of fluid sufficient for the wants of its own system for four or five days; and sometimes, in order to obtain this supply for his own use, under circumstances of desperate emergency, is the Arab obliged unwillingly to sacrifice the life of his beast.

The paunch of the Camel's stomach has its posterior part divided into two portions by a longitudinal ridge; in these compartments is a larger and a smaller congeries of cells, and the whole is capable of being closed by muscular bands so as to retain fluid without either suffering it to escape, or the food to mingle with it. "While the Camel is drinking," says Sir E. Home, "the action of the muscular band opens the orifice of the second cavity, at the same time that it directs the water into it; and when the cells of that cavity are full, the rest runs off into the cellular structure of the first cavity immediately below, and afterwards into the general cavity. It would appear that camels, when accustomed to go journeys, in which they are kept for an unusual number of days without water, acquire the power of dilating the cells so as to make them contain a more than ordinary quantity as a supply for their journey; at least, such is the account given by those who have been in Egypt." The cells of the reticulum are also of extraordinary size and depth.

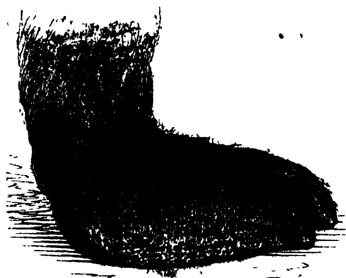
The Camel kneels down to be loaded; and there are seven callosities or firm pads for the support of its

weight; for a heavy animal, and bearing a heavy load, its skin both in the action of rising up and kneeling down would be liable to injury against rough gravel or a hard uneven surface. These pads are one on the breast, two on each of the fore legs, and one on each of the hind. The hump on the back of this creature is a characteristic but not a useless appendage; of a firm fatty consistence, it is a kind of reservoir for nutriment, being observed to diminish from absorption during long abstinence, but to increase again when food becomes abundant.

The Camel's tread is perfectly noiseless: unlike the horse, whose heavy tramp sounds over the plain, and rattles on the pavement, its foot-fall is silent and unheard. "What always struck me," says Mr. Macfarlane, in his 'Constantinople, in 1828,' "as something extremely romantic and mysterious, was the *noiseless* step of the Camel, from the spongy nature of his foot. Whatever be the nature of the ground, sand, or rock, or turf, or paved stones, you hear no foot-fall; you see an immense animal approaching you *stilly* as a cloud floating on air; and unless he wear a bell, your sense of hearing, acute as it may be, will give you no intimation of his presence."

The foot of this animal, (so often referred to, and not without reason, as an evidence of design,) is divided into two toes, each having a horny tip; the division is not, however, complete; for an elastic pad or cushion, constituting the main part upon which the pressure falls, spreads broadly beneath, connecting them together, but leaving the points free. On pressing the ground, the elastic cushion expands, and the

toes diverge, so that a larger surface is brought in contact with the sandy earth, a circumstance which,



in connexion with the elastic nature of the sole, if we may so call it, enables the creature to tread over the yielding desert, or the hard and arid plain, with almost equal comfort.

The foot of the Camel, certainly formed by nature to tread a loose sandy soil, " does not, however, appear to me," says the writer just quoted, " to suffer from stony or hard roads. In Asia Minor there are mountains in every direction; the paths across them are hard, rough, and loose, as rocks and broken stones can make them, yet I have often seen camels treading them without any appearance of suffering; and though I have met them in my travels, hundreds in a day, I do not remember having ever seen a wounded hoof."

The soil most inimical to the foot of the Camel is such as is soft and muddy; here the animal, slipping at every step, keeps on its legs with difficulty. It is

said that so great is its dislike to venture upon such a track, that its drivers have been obliged to spread their tent coverings over the obnoxious ground, in order to conceal its appearance and induce the animal to proceed.

The heavy angular body, the slender neck, the long and meagre limbs of this creature, are little in accordance with our ideas of outward grace and beauty; not so to the Arab. And why should we wonder? To him the Camel is one of the most precious gifts of a beneficent Creator; he feels its value, he experiences its services; to him it is a patient slave, which lives but for his interest.

Such then is the structure of this animal. To the mind rightly tuned, our outline, brief and hasty as it is, will impart a lesson of no trifling importance. It will serve to show how the mercy of God is displayed in all his ways; how carefully he has regarded the wants of man, and the natural obstacles whether of soil or climate, which bar his progressive improvement, or diminish the sphere of his comforts; and, that every difficulty might be overcome, how he has distributed various races of animals expressly for his use. To the fur-clad native of a polar realm, he has given the shaggy Esquimaux dog; to the Laplander, the reindeer; to the dweller in fertile meads beneath an indulgent sky, the horse and the ox; to the wanderer of the sterile desert, the camel, his trust and safety. Thus suiting his gifts to the wants and circumstances of nations, does God prove himself the Ruler of the world in wisdom and mercy.

The Camel is certainly one of the most striking

examples of man's complete dominion over such animals as are necessary to his welfare: it is not now known in an unreclaimed condition; it is born and reared in the servitude of its master. The internal trade of northern Africa is altogether carried on by means of this "ship of the desert." From Egypt, and the towns along the adjacent coast of Africa, namely, Borca, Tripoli, Tunis, Algiers, caravans of camels laden with merchandise set off at stated periods to Timbuctoo, the grand depôt of commerce, and there exchange commodities with the leaders of other caravans, which arrive to meet them from the interior or more distant nations. The Sahara, or great desert of Africa, can be safely crossed by means of the Camel alone; hence its importance to the merchant; nor does the wandering Arab derive less benefit from its services: he loads it with his tents, his wealth, and his family, and traverses the ever-moving sands from one oasis to another; he mounts his *heirie*, and the marauder, whose hand is against every man, comes down like a thunderbolt on his prey.

The pace of the slow-going Camel used for burden is about three miles an hour, tranquil and regular as clock-work, and the load of each animal from five to six hundred weight, placed without much attention to order or the best method of packing; paniers at the sides, bales on the back, children in a bag on one side, a young camel in a bag on the other, a heterogeneous assemblage of merchandise, water-skins, and cooking utensils, all are carried with submissive docility; nor does the creature complain unless

much overloaded, when it will often sink down and expire.

The caravan of camels on the march, or reposing by the spring at evening; the courier posting on his heirie; primeval manners, customs, and language, all associated together before the eye and mind of the traveller, cannot, we should think, fail to call to remembrance those graphic descriptions in Holy Writ, which delineate events as characteristic of oriental manners in the present day, as in ages long gone by, when the brethren of Joseph "sat down to eat bread, when, as they looked up, a company of Ishmaelites came from Gilead with their camels, bearing spicery, and balm, and myrrh, going to carry it down to Egypt."

The use of the Camel is indeed of the earliest antiquity; and the scriptures abound with notices illustrative of its habits and its services. Let the reader turn to that exquisite chapter, Gen. xxiv.: "And the servant took ten camels of the camels of his master." ..... "and he made his camels kneel down without the city by a well of water, at the time of the evening, even at the time that women go out to draw water," ..... "and when she had done giving him to drink, she said, I will draw water for thy camels also, until they have done drinking; and she hasted and emptied her pitcher into the trough, and ran again unto the well to draw water, and drew for all his camels."

We learn also that it was anciently the custom to deck the camel with collars and other ornaments, a practice still prevailing: "And Gideon arose and



CARAVAN AND CAMELS IN THE DESERT.

slew Zeba and Zalmunna, and took away the ornaments that were on their camels' necks," Judges viii. 21.... "and beside the chains that were about their camels' necks," ver. 26.

The use of the Maherry for sending messengers upon, with tidings or letters of importance, is evidently alluded to in Esther viii. 14: "So the posts that rode upon mules and camels went out, being hastened and pressed on by the king's commandment." The same animal is also alluded to by Jeremiah ii. 23: "Thou art a swift dromedary traversing her ways." In Job ix. 25, 26, "My days are swifter than a post, they are passed away as the swift ships." The words translated, "swift ships," are by some commentators supposed rather to mean "riders on swift dromedaries." And also in Prov. vi. 11: "So shall thy poverty come as one that travelleth, and thy want as an armed man." The term "armed man," is said to bear rendering, "Aâsh-are-rider," or "rider on the Maherry."

The allusions to the Camel in the scriptures are so numerous, that we can do little more than refer to them generally. They will force themselves abundantly on the mind of our reader conversant with the sacred writings, and prove how little time has altered the customs of the East. The caravan of Ishmaelites carrying the merchandise and spices of India by way of Bagdad through Syria into Egypt and Africa, still traverses the desert; cloth and garments are still manufactured out of the Camel's hair as much in the present day as when John, with "his raiment of camel's hair, and a leathern girdle about his loins,"



DROMEDARY.

preached repentance in the wilderness of Judea. And the swift Heirie is still used for the conveyance of messengers, as when "Mordecai sent letters by post on horseback, and riders on mules, camels, and young dromedaries," Esth. viii. 10. Also it is still employed in desultory warfare, as when "four hundred young men who rode upon camels" escaped the sword of David, 1 Sam. xxx. 17.

Patient and docile as the Camel usually is, there are certain seasons when it becomes furious, fighting with its fellows, and often attacking even man; it is also keenly sensible of injury, and revenges it on the first opportunity. Should the man who has excited its anger appear within reach, the animal rushes upon him with irrepressible rage, and his life is sure to pay the forfeit. Nothing can be more formidable than its bite, and it strikes and kicks also with great violence. The usual mode for the unfortunate offender to take, in order that he may allay its thirst for vengeance and escape, is to throw down his clothes where the animal may see them: rushing upon them, it tears them to pieces, and scatters them about; and having thus satisfied its fury, the whole affair is forgotten, and the man may appear with safety.

Bruce gives a singular account of the substitution and sacrifice of a Camel, in order to appease the animosity of two contending parties. It was agreed that no one had been to blame but a *Camel;* the whole wrong and all the mischief done was its work. "A Camel was therefore seized and brought without the town; and there, a number on both sides having met,

they upbraided the Camel with every thing that had been either said or done." Having heaped every opprobrious epithet on the Camel; having charged it with the violence each party had suffered from the other, and with all the threats and evil intentions each had fulminated, they thrust it through with their lances, with curses upon its head. In this account we may perceive some traces of the scape-goat of the Jews, the prototype of a Sacrifice for the sins of the world, THE SACRIFICE upon Mount Calvary, where Christ "bore our sins in his own body on the tree;" where he endured all the penalties of a broken law, and finished his mediatorial office. To man, fallen man, no other sacrifice will avail; it is the foundation upon which alone God will accept him, his works, or his petitions; and by that sacrifice he must enter the gates of heaven, "being justified freely by his grace through the redemption that is in Christ Jesus; whom God hath set forth to be a propitiation through faith in his blood, to declare his righteousness for the remission of sins that are past, through the forbearance of God," Romans iii. 24, 25.

In concluding our sketch of the Camel, we may notice that there is one place, and but one, in Europe, where it is reared and used as a beast of burden; namely, Pisa, in Italy. The breed appears to have been established there about the middle of the sixteenth century, and subsequently to have been increased by fresh importations from Tunis. It is, however, much degenerated and far inferior to the race as it exists in its congenial climate, the deserts of Arabia.

A genus closely allied to the preceding next presents itself, taking in the snow-clad and precipitous Andes, the place which the camel occupies in the level desert; it is the genus *Auchenia*, ILLIGER, and it contains the *Llamas*. The genus *Auchenia* possesses many of those characters which we have seen exhibited in the camel; namely, the great cellular developement of the second stomach, the cellular apparatus of the paunch, the absence of the third or plicated stomach, with the concomitant power of enduring thirst, or rather of abstaining from water altogether; the large full overhung eye; the division and mobility of the upper lip, the fissured form of the nostrils, the slender neck and meagre limbs. The feet are, however, unfurnished with pads; the toes are armed with strong nail-like hoofs, pointed, and having an acute upper ridge; there is no trace of a dorsal hump, and we miss the two first canine-shaped molars of the lower jaw; so that the form of dentition will stand thus: incisors above, two; below, six; canine teeth, one on each side above and below; molars above, five on each side; below, four. The body is clothed with long woolly fur, necessary as a protection against the cold of the elevated region which forms the native *habitat*.

The Llamas are far inferior to the camel in size and strength, two properties which render that animal so truly serviceable; but they are more lively and active, having a free and confiding carriage, and an animated expression. There exists even in the present day no little perplexity as to the number of species in the

present genus to be received as truly distinct; a perplexity arising partly from the modifications of external form and appearance which centuries of domestication have produced, and partly from the vague and loose manner in which travellers who have seen the various races in their native climate have spoken of them. We are, however, inclined to agree with Baron Cuvier and the talented author of the "Gardens of the Zoological Society delineated," in considering the species as reducible to two: the GUANACO, of which the reclaimed breed is called the LLAMA, (*Auchenia Glama;*) and the VICUGNA, (*Auchenia Vicunia.*) Of the first, namely, the Guanaco, many authors make at least three distinct species, considering the Llama to be one, and the Paco or Alpaco another. As it regards the Alpaco, it offers no other modification than that of having its wool of a longer and finer texture, a circumstance we know to be dependent very much, even among wild animals, upon soil, food, and slight difference of climate. As for the Llama, its stouter make and variations of colour are effects ever dependant upon a state of servitude, and the more decided and conspicuous, the more complete that state may be.

The Llama, or, as we should call it in its wild state, the Guanaco, inhabits the Cordilleras of the Andes, but especially in Peru and Chili. It does not, however, advance so high as the line of perpetual snows, but prefers a middle region, where temperature and food are both congenial. Here, then, among crags and precipices, and scenery wild and terrific, where the hunter would be foiled even if he dared to venture, vast herds of these animals associate during the sum-

mer, free as the air, and feeding upon the herbage of that elevation, and the grass called *ycho* which covers the mountain slopes. As long as green and succulent vegetables can be procured, the animal never drinks, and it is not improbable that the cells of the stomach retain the moisture of the masticated herbage for the necessities of the system, perhaps even adding to it by a liquid secretion of their own. However this may be, we cannot but acknowledge the wisdom and providential care of God, in forming a creature destined to gladden by its presence the bold cliffs, and barren rocks, and broken mountain steeps of the mighty Andes, so as not only to be able to live without water, but, provided it can obtain its natural food, not even to require it.

Swift, vigorous, and bounding fearlessly from crag to crag, or clambering up the rugged steep, the Llama



exhibits in the structure of its foot a piece of workmanship as admirable as does the camel; and as the

one is expressly formed for the sandy desert, so is the other for the station it occupies upon the earth. How beautiful, how simple, how true to themselves are the laws of nature! Instead of the solid truncated mass composing the foot of the ox, we here see a long slender springy foot, the toes being completely divided, and each protected at the end with a short strong hoof, hooked like a claw at the tip, and ridged acutely above: with such an instrument, so free, so flexible, so calculated for fixing hold of every roughness and projection, the step of the creature is as firm and secure as that of the camel on the plain, or the ox on the glebe. Thus we are again led to admire Him who is the giver of every good and perfect gift.

From the higher grounds where the Llamas continue during summer, the herds migrate as winter comes on into the sheltered valleys and defiles, where the Chilians hunt them with dogs. The chase is arduous; and it is only with the young that there is much chance of success; the old ones, fleet and strong, seem to mock their pursuers, upon whom, we are told, they will frequently turn, "neigh with all their might, and then set off again at full speed."

The Guanaco in captivity is free and confident, as all who have noticed the beautiful specimens in the Garden of the Zoological Society must have soon observed; for not only do they boldly approach strangers in hopes of some delicate morsel, but are ever ready to testify their displeasure by a discharge of saliva over the person of any one who may unwittingly give them offence. This is the usual mode in which the Llamas manifest their anger or impatience, though they will

sometimes also strike with the fore legs, especially when forced to act vigorously on the defensive

The colour of the Guanaco, with slight variations, is usually a deep rich fawn, verging to white on the under parts, the head is of a dull gray, the wool is fine, long, and of a silky texture, but is shorter on the neck and limbs than on the body. In the Alpaco the neck, we believe, is as well covered as the other parts The stature of the animal to the top of the shoulder is about four feet. The long slender neck is held erect and swanlike

The wool and the flesh of the Guanaco, connected with the ease with which the animal is domesticated, must have attracted from the earliest times the notice of the ancient Peruvians The Spaniards on their conquest of Peru found the Llama the only beast of burden, supplying the place of the horse, the ox, and the ass, its flesh also was the staple article of animal diet

The Llama, or reclaimed Guanaco, of which our plate represents a beautiful specimen, exhibits the usual characters produced by domestication The size is greater, the body stouter, the limbs more muscular, and the wool longer and coarser than are found in the Guanaco, the physiognomy too has lost its air of wildness and independence, and the profile, instead of exhibiting that arched outline so remarkable in its freeborn relative, is flat, and expressive of mildness and subjection The colour is also subject to much variation, being white, brown, black, or even mixed

Gentle and docile, the Llama has nothing of the active energy of the Guanaco, on the contrary, its

step is slow and regular. Its load is at the most one hundred and fifty pounds, with which it will travel



fourteen or fifteen miles a day along rugged mountain passes and the narrow ledges of precipitous rocks with a firm and sure step; but it will bear neither to be loaded too heavily nor urged beyond its regular temperate pace; for, with a display of obstinacy almost unexpected in so mild an animal, it will under such circumstances lie down, refusing with the utmost pertinacity to proceed a single step. In this respect it in fact resembles the camel.

The great use which the Peruvians made of the Llama was in bringing down from the mountains the produce of the mines, a laborious office in which mules are now more generally employed; it is, however, by no means disused, for, though not equal to heavy labour, it is recommended by the little cost at which it may be maintained.

Gregory de Bolivar estimates that in his time four millions were annually killed for food, and that three hundred thousand were employed in the transport of the produce of the mines of Potosi alone. The wool is manufactured into articles of clothing and coarser stuffs, and its skin makes excellent leather.

The VICUGNA, *(Auchenia Vicunia,)* is a much more hardy animal than the Guanaco, and inhabits a range of higher elevation, near the line of snow, and where the cold is more intense. Its size is considerably less; but its wool is of exquisite fineness and delicacy, and is very valuable for the manufacture of expensive shawls and other articles of dress. It is said that eighty thousand are yearly killed for the sake of their wool, and yet that the species does not appear to diminish. Instead, however, of this barbarous and narrow-sighted way of proceeding, it would, we imagine, be much better, as it is no doubt practicable, to reclaim the creature, and add it to the number of those which man feels it his interest and duty to protect. Its colour is a pale yellowish fawn.

Next in succession to the Llamas we find the genus *Moschus,* comprehending a group of elegant and beautiful little animals known by the name of Chevrotains, or Musk-deer. These animals, though exhibiting one or two of the characters of the camels, bear no similarity to that race in size, form, or habits.

One of the species of this genus is celebrated as the creature producing the costly substance called musk, the secretion of certain glands, and valuable as a per-

fume, and also formerly much used as a medicine. This creature, the true Musk-deer, has given its name to the whole genus, for none of the others produce this secretion; besides which, they exhibit many other points of difference: for example, their hoofs are long, narrow and pointed, the posterior rudimentary hoofs being high set, small, and conical; while in the true Musk-deer the hoofs are broad and expanded, and the posterior large, and almost touching the ground; still the general and essential characteristics are the same.

In the arrangement of the teeth, the genus Moschus is nearer the Deer than it is the Camels, notwithstanding the presence of canine teeth in the upper jaw, extending in the males to so great a length as to project like tusks from the mouth; but incisor teeth are found alone in the lower jaw, and to the number of eight; the molars are six on each side above and below; their crowns, however, instead of being flat, are tuberculous, the first in the upper and two first in the lower jaw having indeed sharp cutting edges and points. The head, as in the camel, is destitute of horns, the deficiency being supplied by the developement of the canine teeth; the general form and contour is that of the Deer in miniature; but the body is rounder and stouter, the neck much shorter, the head not carried erect, and the bearing not so bold; the face also is narrower, the muzzle pointed, and the slits or lachrymal fossæ below the eye, so conspicuous in the deer and antelope, are wanting; the eye is full, large, dark, and brilliant; the legs are slender and tapering; and the haunch, the highest part, is round and expanded.

Besides the celebrated Musk-deer, the genus contains four others; natives one of Ceylon, and three of Java, the smallest and the most elegant of the ruminating order.

The MUSK-DEER, (*Moschus moschiferus*, LINN.) is itself by no means so small and graceful as its scentless congeners: in size it is as large as a roebuck, and is covered with hair, long, (so as to conceal the tail, which is merely rudimentary,) coarse, and harsh, and waved with a mixture of brown yellow and whitish, so as to produce a dark rufous tinge on the back, fading off to white beneath. A thick tuft of hair hangs on each side from the lower jaw; the tusks of the male are about three inches in length, very sharp, curved gently backwards, and edged posteriorly.

The Musk-deer is a wild, solitary, and timid animal, residing among broken crags and mountain precipices, and ever cautious and watchful against surprise; it is eagerly hunted for the sake of the perfume, peculiar to the male alone. As soon as an individual is killed the hunter removes the musk-pouch, situated on the abdomen, and ties it up to be ready for sale: it usually contains about two drachms.

The Musk-deer is peculiar to the Asiatic continent, and especially to that region of wild rocks and mountains whence many of the rivers of Asia have their source, and which extends between Siberia, China, and Thibet. It is from Thibet and Tonquin that the highest scented musk is imported; as we pass northward we find it deteriorate and become almost inodorous.

The four remaining and closely allied species of this genus are, 1st, the MEMINNA, *(Moschus meminna,* SCH.) a beautiful little creature from Ceylon, about the size of a hare, with large dark eyes, and smooth shining hair of an olive colour clouded with reddish about the limbs; the sides are dappled with interrupted lines and irregular dots of white; the throat and chest also are white, and from the former two lines of the same colour on each side radiate backwards, the lower one extending to the shoulders. This peculiar marking of the throat, specifically varied in a slight degree, is characteristic of these four charming species; of which the 2nd is the JAVANESE CHEVROTAIN, or Musk-deer, *(Moschus Javanicus,* PALL.) a native, as its name imports, of Java. The size of this little creature is that of a rabbit, the legs being scarcely so thick as a common quill; its general colour is a uniform ferruginous brown, clouded with black, with the usual throat-marks.

The 3rd is the NAPU MUSK-DEER, *(Moschus Napu,)* also a native of Java, and the one to which Sir Stamford Raffles applied the term *Javanicus,* which we have retained for the previous species. The Napu Musk-deer, as well as the Meminna, has been recently living in the Collection of the Zoological Society of London; and the Museum contains several interesting specimens. From an admirable essay on this animal in the "Gardens delineated," we take the liberty of making a few extracts. "In size it is about equal to a full grown hare; its colour above is dark, glossy, ferruginous brown. ..... The under parts and inside of the legs are pure white, as are also the throat and chin;"

whence the white lines radiate as usual, but with abrupt edges.

"The Napu frequents thickets near the sea-shore, and feeds principally upon berries. It seldom visits the larger forests, which are the favourite resort of the Kanchil; for it does not possess either the agility or the cunning of the latter, to secure it from danger, and prefers therefore the vicinity of man, with whom it readily becomes familiar, to that of the beasts of prey which inhabit the interior. When taken young, it is tamed with the greatest facility. In captivity it appears perfectly at its ease and quite indifferent to what is passing around it. Its full dark eye and placid air give it the appearance of a degree of intelligence which it does not really possess, for the greater part of its existence is passed in eating, drinking, and sleeping. Its voice is scarcely more than might be produced by a deep but still a gentle expiration."

The 4th is the KANCHIL MUSK-DEER, (*Moschus Kanchil*, RAFF.) to which we have already alluded in the previous extract. It is also a native of Java, where, timid and distrustful, it seeks the deep solitude of the forests to shun the eye of man. Its height is about nine inches, its length fourteen; its colour is a strong reddish brown, approaching to black on the back, and shading off to bright bay on the sides, the under parts becoming white. The markings of the throat vary in their arrangement from those of the Napu, the upper line of white extending from the jaw to the shoulder. The canine teeth are long; the tail tufted and white at the tip. Berries and wild fruits constitute its diet.

Before we leave this charming and elegant group,

we have to remark that there appears to exist some degree of confusion among the species, which remains still to be fairly cleared up. For a fuller elucidation of this point, we would refer our readers to the admirable essay from which we have just quoted.

A multitude of beautiful creatures now present themselves, of graceful form, elastic step, and animated expression. We see them bounding over the plains and through the forests in every quarter of the globe, from the poles to the equator. Congregated in herds, they wander wild and free; their very air is that of freedom, and every action proclaims independence. Their limbs are strong, slender, and sinewy; their neck tapering, and swan-like; their head small, held high, and garnished in the males with antlers. Such are the Stags and the Deer, a multitudinous race that compose the genus *Cervus*.

The generic characters are simple: Incisor teeth in the lower jaw alone eight; grinders six on each side above and below. Beneath the inner angle of the eye there is a deep slit or fossa, generally known as the lachrymal sinus; but of the use of which nothing is yet ascertained. The ears are large and pointed. The antlers, found with one exception, namely, the reindeer, alone in the males, are solid, and annually shed and renewed. Their character differs in different species, some being broad and expanded, with a short stem; others, being tree-like, branching out into numerous ramifications; others again, with a long stem, becoming palmated at its extremity.

The production, loss, and renewal of the antlers of this class of animals are among the most remarkable

phenomena of animal physiology. To understand it we must place the skull of a deer before us. We behold the frontal bone (bone of the forehead) divided by a longitudinal suture, or fissure, into two portions, which never become consolidated into one, as in man, in whom also this frontal bone is originally thus divided; each portion consisting of fibres of osseous matter radiating from a centre of ossification. In man these two portions soon unite into one, every trace of division becoming obliterated: not so in the deer; for the osseous matter radiating from the two centres of ossification, so as to complete two bones, with edges in contact and dovetailing together, ceases to be deposited any longer on these margins so as to make the union perfect, but is forthwith accumulated upon the very centres themselves, raising them up into conical protuberances, covered by the skin. But the work does not rest here: these protuberances, formed during the creature's nonage, are to be the foundation whence future antlers are to arise. The days of nonage are past; spring kindles the blood of the youthful stag, and volume after volume of the vital stream rushes impetuously to the head; and now begins another process; the arteries of the skin, enveloping these two protuberances of bone, dilate, and, taking upon themselves a new action, deposit atom by atom on the tops of these protuberances layer after layer of osseous matter with astonishing rapidity: the antlers are growing, and as they grow the skin grows with them, and the arteries enlarge more and more, acquiring an astonishing circumference, and leaving their course permanently imprinted in long furrows on the horn;

thus the process goes on by the agency of these vessels, whose extreme capillaries elaborate the osseous particles (phosphate of lime) from the blood, adding them to the layers newly deposited, till the antlers have acquired their due degree of developement, a degree regulated by the age of the individual or the vigour of the system. The skin, as we have said, still envelopes every part, and every fork; it is highly vascular, tender, soft, and velvety; it is, indeed, termed "*the velvet.*" But now another process begins: this *velvet* must be got rid of, for these antlers have to endure the brunt of conflict, and must be hard and insensible. What is to be done? Nature now acts the part of a surgeon, who applies a ligature round a vessel to stop the current of blood; she does the same, but not suddenly; for so great a mass of blood suddenly prevented from running its accustomed course would be turned upon the brain, and apoplexy would be the consequence. This part of the process then is gradual, but not dilatory. The arteries at the base of the antlers, where they are in junction with the bony protuberances, began early to deposit around that spot a ring of osseous matter, with notches through which the arteries passed. The arteries which formed this ring are the last to act, and their work now is to cause the openings or notches through which the great arteries pass to contract more and more, the compression of the arteries taking place accordingly, till the ligature is tight and obstruction completely effected. What follows? The velvet covering of these antlers dies for want of the supply of the vital fluid; it shrivels like parchment, splits, and peels off in ribands, which the

animals assist to remove by rubbing the antlers against a tree. They are finished; white, polished, and pointed, the ring, called the burr, remaining to ornament their base.

This process occupies about ten weeks; in this time, in the stag for instance, a mass of phosphate of lime, with a certain portion of gelatine, amounting to twenty or thirty pounds, or even more, is elaborated from the blood of the system; but in that extinct animal, the Irish elk, whose broad palmated horns have a span from tip to tip of twelve to fifteen feet, twice as much of this matter as the rest of the skeleton would contain was annually produced, a fact as wonderful as the quickness of the process.

Nothing can be more beautiful than the Stag thus proudly armed and ready to combat with his rivals, like the champion of old in the tournament with his lance in rest.

As soon as they are thus finished, the antlers have ceased to be part and parcel of the system; that is, they have now no vital connexion with the skull, to which they only *adhere*, not *grow*, and of which they are parts by the laws of aggregation, not of vitality. Thus fixed, they continue during the winter, till spring returning rouses the circulation, and again bids the blood roll in tides to the head, that the process may be again repeated. The old antlers must be thrown off. But how? They are beyond the bounds of the system; and must nature wait till, by the laws of chemistry, the atmosphere and moisture shall have crumbled them away? Impossible. What then is to be done? Nature can act within the vital bounds of

the system, and does act, setting up a process of absorption at the line of junction where they anchylose with the protuberances, in order to undermine them at their base; and this process is continued till the union is so far dissolved that by the least motion or slightest rub against a tree they fall off, leaving the protuberances exposed and bleeding. The flow of blood, however, soon ceases, the skin closes over, and the new antlers begin to bud; but the process re-occurs with increased vigour; these antlers grow larger than the last, and with additional branches; next year they will be larger still, and so on for several successive seasons.

How simple, how direct, how unfailing, and yet how mysterious, are the laws which God has given to nature! how worthy of Him whose wisdom is still more marvellously displayed in the laws of a system of mercy by which, through one atonement, the guilty may be pardoned, and he who is led captive by sin be set free, and brought into the glorious liberty of the gospel.

We shall now proceed to the selection of a few characteristic examples of the present group; and first we notice the ELK, (*Cervus Alces*, LINN.) The Elk is a native of the wooded wilds of Poland, Sweden, and Scandinavia, as well as of the northern regions of America, where it is generally known by the name of *Moose-deer*, a corruption of the Cree-Indian term "*moo-soa*." Whether the Scandinavian Elk and the Moose-deer are truly identical, is as yet by no means clear, though such is supposed to be the case by naturalists

in general; yet it is far from being unlikely that a strict comparison might lead to the establishment of



specific differences, or, at least, differences of such a nature as are commonly found to distinguish between the native animals of America and their European representatives.

The word Elk is of Celtic origin, "*elch*," whence the Swedish "*ælg*;" the Latin word *alce*, or *alces*, used by Pliny, but first occurring in the writings of Cæsar,

being nothing more than the original Celtic adopted into the Roman language. This animal is the largest of the genus *cervus*, exceeding the horse at the shoulders; it is, however, of all its congeners the least distinguishable for elegance or grace. The head is large and elongated, having the muzzle and upper lip both equally covered with short hair, singularly projecting and flexible, something like that of the tapir, and serving for the purpose of drawing down or directing to the mouth the shoots and twigs of trees on which it is accustomed to feed. The ears are large and open; the eyes small and inexpressive; the neck is short and powerful; and the withers high and narrow, both being surmounted by a coarse mane; the body is strong and short, and raised on legs of such disproportionate length as to give the idea of the animal being supported upon stilts, an idea still farther strengthened by the straddling awkwardness of its steps. The horns, which do not attain to their perfect shape until the fifth time of renewal (the sixth year,) are of enormous size, some having been found to weigh as much as sixty pounds; hence the strength and shortness of the neck for supporting the strain. Below the throat hang two pendulous slender dewlaps of loose skin. The tail is very short; the hair is full, long, coarse, and harsh, black at the tips, gray in the middle, and white at the roots.

Awkward as is the pace of the Elk, the animal can sustain a chase of long continuance: it does not bound like the deer, or gallop like the horse, but strides along, its hoofs loudly cracking at every step; for, like those of the rein-deer, they are broad and divided highly so as to diverge on pressing the ground, thereby consti-

tuting natural snow-shoes; and when each portion is brought smartly together, by the sudden raising of the limbs, that peculiar cracking is produced, and may be heard at a considerable distance. When exerting its speed, the Elk brings the hind legs so far forward at each step, in consequence of their great length and the shortness of the body, that, to avoid treading on its own fore heels, it is obliged to throw the hind legs obliquely outwards, and even then cannot sometimes, it is said, avoid giving itself a heavy fall. Leaping is out of the question; but it steps over any common impediment, as a fallen tree, without any effort.

In passing along, the Elk usually carries its head horizontally, or rather with the nose elevated so as to lay the horns back on each side of the neck in order to prevent their entanglement among the branches of the forest.

The information we possess as to the habits of this animal is principally gained from the American variety or Moose-deer, with which we have most opportunities of becoming acquainted; to that animal, therefore, our succeeding remarks especially apply.

The Elk, or Moose-deer, is fond of the water, and is an excellent swimmer; indeed, during the summer, it is often known to remain day and night immersed in the marshes, in order to escape the tormenting mosquitoes, contenting itself with such herbage as it can conveniently reach. Its natural food consists of twigs and leaves; except from necessity, it never attempts to graze, its length of limb and shortness of neck rendering it a work of difficulty to bring the mouth to the ground; it browses therefore on "the tops of large plants and the leaves of trees in summer," and "in

winter on the tops of willows and the small branches of the birch-tree; on which account the animal is never found in that season but in such places as can afford a plentiful supply." The flesh and tongue of the Moose-deer is highly valued as food by the native tribes of the boreal regions of America; and its skin forms excellent leather for mocassins: its chase, therefore, is highly important, but at the same time toilsome and hazardous.

"The Moose-deer," says Dr. Richardson, in his Zoology of the Northern Parts of British America, "has the sense of hearing in very great perfection, and is the most shy and wary of all the deer species; and on this account the art of Moose hunting is looked upon as the greatest of an Indian's acquirements, particularly by the Crees, who take to themselves the credit of being able to instruct the hunters of every other tribe. The skill of a moose-hunter is most tried in the early part of the winter, for during the summer the Moose, as well as other animals, are so tormented by mosquitoes, that they become regardless of the approach of man. In the winter the hunter tracks the Moose by its footmarks in the snow; and it is necessary that he should keep constantly to leeward of the chase, and make his advances with the utmost caution, for the rustling of a withered leaf, or the cracking of a rotten twig, is sufficient to alarm the watchful beast. The difficulty of approach is increased by a habit which the Moose-deer has of making daily a sharp turn in its route, and choosing a place of repose so near some part of its path, that it can hear the least

noise made by any one that attempts to track it. To avoid this, the judicious hunter, instead of walking in the animal's footsteps, forms his judgment from the appearance of the country, of the direction it is likely to have taken, and makes a circuit to leeward until he again finds the track; this manœuvre is repeated until he discovers by the softness of the snow on the footsteps, and other signs, that he is very near the chase. He then disencumbers himself of every thing that might embarrass his motions, and makes his approach in the most cautious manner. If he gets close to the animal's lair without being seen, it is usual for him to break a small twig, which alarming the Moose, it instantly starts up, but not fully aware of the danger," delays for a moment, a moment precious to the hunter, who is seldom known to miss so fair an aim.

"In the spring time, when the snow is very deep, the hunters frequently run down the Moose on snow-shoes. An instance is recorded in the narrative of Captain Franklin's Second Journey, where three hunters pursued a Moose-deer for four successive days, until the footsteps of the chase were marked with blood, although they had not yet got view of it. At this period of the pursuit the principal hunter had the misfortune to sprain his ankle, and the two others were tired out; but one of them, having rested for twelve hours, set out again, and succeeded in killing the animal, after a further pursuit of two days' continuance. Notwithstanding the lengthened chase which the Moose can sustain when pursued on the snow, Hearne remarks that it is both tender-footed and short-

winded, and that were it found in a country free from underwood and dry under foot, it would become an easy prey to horsemen and dogs."

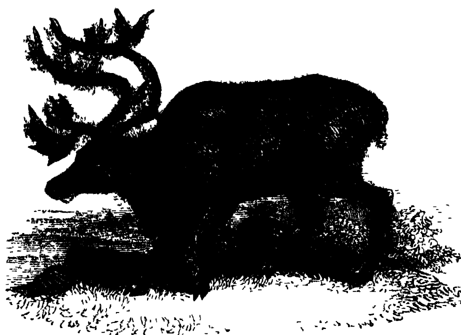
Though the Moose is habitually shy and timid, the male at certain seasons becomes bold and furious, striking with horn and hoof, and impetuously attacking every animal that comes in his way: the work of the hunter is then very dangerous; for if his shot fails to take effect, his life is in jeopardy unless a tree be at hand behind which he can shelter himself; and instances are recorded where the enraged animal has completely stripped the bark from the lower part of the trunk of a large tree by striking it with his feet.

When taken young no animal of the deer kind is more easily domesticated or becomes more confiding. In a state of nature it appears to lead a solitary life, not congregating like other deer, but each living and acting independent of its fellows. The size acquired by the males is very great: it is stated that they sometimes attain the weight of eleven or twelve hundred pounds.

Several fine specimens of this animal are in the collection of the Zoological Society of London.

The REINDEER, (*Cervus Tarandus*, LINN.) Of the various animals which man has reclaimed from a state of independent freedom, some, as the dog, the ox, and the horse, have spread as he has spread, and have accompanied him through almost every country of the globe; others again, whose utility, though less general, is still of no mean importance, have remained bound, as it were, to certain latitudes, isolated regions,

where, with a nature accordingly adapted, they usurp the place of their more extensively employed brethren, whose wonted services would here be unavailable. Thus the Camel for the arid deserts of the East, the Llama for the snow-clad Cordilleras, and the Reindeer for the hills and plains of Lapland.



The Reindeer is not, however, exclusively confined to Lapland; it is extensively spread within the arctic circle, through Europe, Asia, and America; its most southern limits varying according to circumstances. In America, although most numerous between the latitudes 63° and 66°, it is found as low as the parallel of Quebec. In the Old World the parallel of the Baltic, or about 60°, is its southernmost range; but the countries in which it abounds are farther north, namely, Finmark, Lapland, the adjacent parts of Norway and Sweden, the vast extent of Siberia, and Kamskatka.

In America there are, according to Dr. Richardson, (see the *Fauna Boreali-Americana*, p. 241,) two distinct varieties of the Reindeer; the one called the "barren ground Caribou," the other the "woodland Caribou;" and it may be not unreasonably suspected that both these will be found to differ from their cis-atlantic representative. The "barren ground Caribou," says Dr. Richardson, "is small of stature, and weighs so little, that I have seen a Canadian voyager throw a full grown doe on his shoulder, and carry it as an English butcher would a sheep. The bucks are of larger size, and weigh when in good condition from ninety to a hundred and thirty pounds." The "woodland caribou" is larger, scarcer, with smaller horns, and vastly inferior as food; its proper country is a "stripe of low primitive rocks, well clothed with wood, about a hundred miles wide, and extending at the distance of eighty or a hundred miles from the shores of Hudson's Bay, from Athapescow Lake to Lake Superior;" whence the herds travel southwards in the spring, contrary to the usual routine. Speaking of the barren ground Caribou, the same author states that, though when lean its flesh is insipid, when fat and in season "it is superior to that of the finest English venison."...."The Chipewyans, the Copper Indians, the Dog-ribs, and Hare Indians of the Great Bear Lake, would be totally unable to inhabit their barren grounds were it not for the immense herds of this deer that exist there. Of the Caribou horns they form their fish-spears and hooks; and, previous to the introduction of European iron, ice-chisels and various other utensils were likewise made of them. The hide

dressed with the fur on is excellent for winter clothing, and supplies the place both of blanket and featherbed to the inhabitants of these arctic wilds." From the hide also is made a " soft and pliable leather adapted for mocassins and summer clothing; and when sixty or seventy skins are sewed together, they make a tent sufficient for the residence of a large family. The shin-bone of the deer split so as to present a sharp edge is the knife that is used to remove the hair in the process of making the leather. The undressed hide, after the hair is taken off, is cut into thongs of various thickness, which are twisted into deer-snares, bow-strings, net-lines, and, in fact, supply all the purposes of rope; the finer thongs are used in the manufacture of fishing-nets, or in working snow-shoes, while the tendons of the dorsal muscles are split into fine and excellent sewing thread." Nor is the Reindeer less useful as food; for this it is hunted or taken in traps and pounds, or lured to its fate by various artifices of Indian stratagem. Like the birds and quadrupeds in general of that dreary clime, it migrates northwards and southwards according to the seasons, followed by the native tribes, who have never yet attempted its domestication, but regard it solely as a beast of chase.

Leaving America, let us turn to our own portion of the globe, where the most interesting picture of the Reindeer and of the services it renders to man, is alone to be sought for. The Samoedes and the rude inhabitants of the whole of Northern Asia, use, it is true, the Reindeer as a beast of burden; but it is only in Lapland, where indeed it is essential to the wants and improvement of a pastoral people, that its value is

truly appreciated. In that region, where the only food for cattle, to be obtained during winter, consists of the lichens and mosses dug up from beneath the snow, or torn down from the trees, where they grow in long and pendent festoons; and during a short summer, of the coarse grass of the swamps and morasses, and of the leaves and shoots of the birch and sallow, the horse and the ox would be unable to exist; but the Reindeer supplies their place, furnishing food and clothing, and lending its labour in patient servitude.

This animal is essentially migratory, and so far is this instinct from being checked by domestication, that the Laplander is himself obliged to conform to the periodical motions of the herd, in which consists his only treasure. The deep and boundless forests of the interior abounding in its winter food are the resort of the Reindeer during that season of the year so dismal beneath a boreal sky; but on the approach of spring, when these recesses begin to pour out myriads of insect foes, of all others the most dreaded, the herds unanimously make for the shore or the high mountain ridges, swept by the keen winds of the ocean, which repel the pursuit of the tormenting gadfly. Hence, guided by their herds, the Laplanders are forced to periodical journeys of great toil and labour; and as these animals are the wealth of a whole population, (with the exception of the few who live constantly on the shore and subsist by fishing,) a population necessarily without an abiding city, we have before us a modern instance of a nomadic people, pitching their tents according to circumstances of season or pasturage.

Mr. De Capell Brooke, whose "Winter in Lapland," exhibits an interesting picture both of the Laplanders and their Reindeer, observes that "the causes that induce, nay even compel, these people to undertake their long and annual migrations from the interior parts of Lapland to its coast, though they may appear singular, are sufficiently powerful. It is well known from the accounts of those travellers who have visited Lapland during the summer months, that the interior parts of it, particularly its boundless forests, are so infested by various species of gnats and other insects that no animal can escape their incessant persecutions. Large fires are kindled, in the smoke of which the cattle hold their heads to escape the attack of their enemies, and even the natives themselves are compelled to smear their faces with tar as the only certain protection against their stings. No creatures, however, suffer more than the Reindeers from the larger species, (*Œstrus Tarandi,*) as it not only torments them incessantly by its sting, but even deposits its egg in the wound it makes in their hides. The poor animal is thus tormented to such a degree that the Laplander, if he were to remain in the forests during the months of June, July, and August, would run the risk of losing the greater part of his herd, either by actual sickness, or from the Deer fleeing of their own accord to mountainous situations to escape the gad-fly." For the same reason the wild herds, which are numerous, also undertake the same extensive migrations from the forests of the interior to the mountains of the coast.

The Reindeer, as we have said, is the only wealth

of which the Laplander can boast, and his rank and dignity are measured by the extent of his herds. The number of Deer, says De Brooke, "belonging to a herd is from three hundred to five hundred; with these a Laplander can do well, and live in tolerable comfort. He can make in summer a sufficient quantity of cheese for the year's consumption, and during the winter season can afford to kill deer enough to supply him and his family pretty constantly with venison. With two hundred deer, a man, if his family be but small, can manage to get on; if he have but one hundred, his subsistence is very precarious, and he cannot rely entirely upon them for support; should he have but fifty, he is no longer independent nor able to keep a separate establishment, but generally joins his small herd with that of some richer Laplander, being then considered more in the light of a menial, undertaking the laborious office of attending upon and watching the herd, bringing them home to be milked, and other similar offices in return for the subsistence afforded him." A herd of five hundred antlered Reindeer collected together at milking time, and surrounding their owner's tents, must present a noble sight, in full accordance with the wild romantic scenery; nor can it fail to bring to mind scenes of a similar character, when in the days of primitive simplicity the Patriarchs were shepherds, and kings were called from the fold.

Thus far may we see the value of the Reindeer to the Laplander: its skin, its flesh, its milk, its bones, and sinews, are all essential either to his welfare or

convenience; but there is still one use, and that most important, which we have yet to glance at.

> "Obsequious at their call the docile tribe
> Yield to the sledge their necks, and whirl them swift
> O'er hill and dale, heap'd into one expanse
> Of marbled snow, far as the eye can sweep
> With a blue crust of ice unbounded glazed."

The civilization of Lapland, which is said to be steadily advancing, and which of course must in a measure result from its intercourse with other nations, depends upon the Reindeer as the only beast of burden and conveyance. A traveller may pass through Sweden with horses, but when he crosses the border line of Lapland, he must step into the sledge drawn by the "rapid reindeer." A talented writer observes, that, "with this faithful servant, the Finmart dealer may travel from his native wilds to dispose of his produce in the markets of Tornea and Stockholm. The reindeer alone connects two extremities of a kingdom; and without him the comforts and the knowledge of civilized life could never be extended over those countries, which, during a great part of the year, are cut off from all other communication with the other portions of mankind."

The sledge is a light vehicle, running not on wheels, but on its flat boards, which are covered with leather. The Reindeer is yoked to it by a collar, and guided by reins attached to its horns: the usual load is from two hundred and forty to three hundred pounds, and with this the animal will trot over the glazed snow at the rate of ten miles an hour; and it is said that its

power of endurance is such that journeys of a hundred and fifty miles in nineteen hours are not uncommon. "There is a portrait of a Reindeer at the palace of Drotningholm, in Sweden, which is represented upon an occasion of emergency to have drawn an officer with important dispatches the incredible distance of eight hundred English miles in forty-eight hours. The event is stated to have happened in 1699, and tradition adds that the deer dropped down lifeless upon his arrival."

In the year 1769 experiments were made by M. Pictet, a French astronomer, in order to ascertain the speed of the Reindeer exerted to the full for a short distance. Of three deer yoked to light sledges, the first performed three thousand and eighty-nine feet eight inches in two minutes, (that is at the rate of nearly nineteen miles an hour;) the second did the same distance in three minutes, and the third in three minutes twenty-six seconds.

The strength of the Reindeer is very great, the body being firm and thickset, the neck deep and muscular, the withers high, the limbs short and robust, with thick and bony fetlocks; the foot, constructed with reference to the yielding snow over which it has to proceed, instead of having narrow pointed hoofs as is found in the deer tribe in general, has these parts broad, rounded, and divided by a long fissure, so as to expand widely on pressure, and act as efficient snow-shoes. Hence, as in the elk, they make a loud cracking noise in running, occasioned by their clashing together each time the limb is vigorously raised. The head is large, the muzzle covered with hairs; the

horns, which in this animal are found both in the male and female, though by no means so large and fine in the latter, are bold and branching, the brow antlers being palmated broadly as well as the extremities, whence numerous snags and ramifications are given off irregularly; between the brow antlers and the extreme palmation there is a great extent of stem, usually throwing off minor palmations or single snags. The males shed their horns much earlier than the females; they are in full perfection in September.

The fur of the Reindeer, which is subject to individual variation of colour, and which in the brown individuals becomes of a grayish white in winter, is of all others the most efficient for withstanding the cold of an arctic winter. The hairs are so close set as to make it difficult or rather impossible to discover the hide between them; added to which, they are long and coarse, and thus form an impenetrable covering.

Dr. Richardson says that the skin of this animal forms a dress so "impervious to cold, that, with the addition of a blanket of the same material, any one so clothed may bivouac on the snow with safety in the most intense cold of an arctic winter's night." Of this material, so intrinsically valuable, are the dresses made of the native tribes of the polar regions.

The height of the Lapland Reindeer is about four feet; the female being a few inches less.

Many attempts have been made to naturalize the Reindeer in our British Isles; and herds have been procured and placed among the mountains of Scotland and Ireland, as well as in parks and heaths in England; but every experiment has hitherto failed,

every individual sickening and dying after a longer or shorter period.

In the Elk and the Reindeer we see two examples of a division characterised by compressed and palmated horns, a feature which we do not lose abruptly in passing from them, but recognise a gradual transition to the round and branching horns of the next section, exemplified in that common denizen of our parks, the fallow deer, where we find a union of the two characters; the horns being spread out into a flat palmation at their extremities, but giving off from their rounded stems pointed arborescent snags. With the Reindeer, however, we lose that peculiar, firm, and bony contour of body, exhibiting at once a union of strength and speed, and enter upon a race distinguished by a more elegant symmetry and a lighter make, a race of beautiful and graceful creatures, which charm by their elegance of figure and the light bounding freedom of their movements.

Extensively spread over the globe, some we find within the range of the arctic circle, chased by the fur-clad hunter; and others again beautifying the plains of Asia, the prey of the leopard and tiger. To this law of extensive diffusion, however, Africa is a singular exception, one or two species only (and of which we may notice the fallow deer) being natives of its northern line; but in its central and southern regions, where antelopes swarm, no deer have been as yet discovered. Closely allied in disposition, in habits, and manners, one general description, except as it regards specific distinctions, is applicable to all.

Of the *Deer* with horns palmated at their upper extremity, Europe produces the FALLOW DEER, (*Cervus Dama*, LIN.) originally a native of Barbary, where it is still found wild; and of the *Stags* with horns having round stems and conical branches, the STAG, or Red Deer, (*Cervus Elaphus*, LIN.) These noble ornaments of our parks and chases are well known. Before cultivation had extended so thoroughly over our island, while immense tracts yet lay wild and unbroken by the plough, these animals abounded in much greater numbers than at present, protected by the severest laws; the stealer of deer and the outlaw were synonymous; and the ancient ballads of our rude forefathers celebrate the deeds of men who, in defiance of the edicts of absolute monarchs, "bent their bows, and lived upon the chase;" and Robin Hood, and "Adam Bell, Clym of the Clough, and William of Cloudesley," are names interwoven with our national ballads.

The modern disforesting of many of the royal chases has contributed to the reduction of the Red Deer, which requires a larger and much more extensive range of country and a more uninterrupted seclusion than smaller parks can afford, and where its place is supplied by the fallow deer. Still, however, it exists in numerous herds in our royal parks and chases, and in the parks of some of the nobility. In the forest of Athol at the present time a hundred thousand acres are devoted for the range of the Red Deer. They were formerly abundant among the mountains of Scotland, and herds still linger in the Grampians,

once so noted for the chase "with hound and horn," and the robberies and the conflict of civil and international discord. The Stag does not acquire his antlers in full perfection till the sixth year: the second year the horn is straight; the third year gives the brow antler, and a snag; the fourth another snag, and so on to the number of six or seven.

Closely allied to our stag is the WAPITI DEER of North America, (*Cervus Wapiti*, MITCHELL.) The

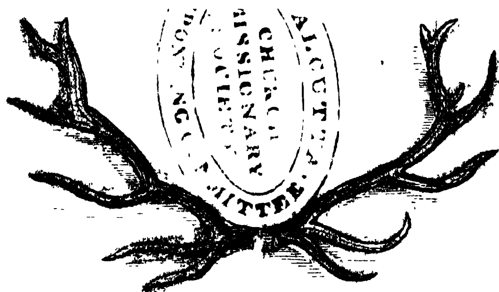


Wapiti, which has often, though erroneously, been called the American Elk, is a native of Canada, but

does not, as Dr. Richardson informs us, "extend its range further to the north than the 56th or 57th parallel of latitude, nor is it found to the eastward of a line drawn from the south end of the Lake Winipeg to Saskatchewan, in the 103d degree of longitude, and from thence till it strikes the Elk River in the 111th degree. To the south of Lake Winipeg it may perhaps exist further to the eastward. They are rather numerous among the clumps of wood that skirt the plains of the Saskatchewan, where they live in small families of six or seven individuals. They feed on grass, on the young shoots of willows and poplars, and are very fond of the hips of the *rosa blanda,* which forms much of the underwood of the districts which they frequent."

The native name of the Wapiti on the borders of the Saskatchewan River is "*Wawaskeesh,*" and the animal was long supposed by the fur traders to be the same as the stag of Europe. It is, however, a foot taller, being four feet and a half at the shoulders; nor is its colour of the dark blackish brown of our species, but of a grayish brown with a tinge of yellow, a black mark extending from the angle of the mouth along the lower jaw. The horns are of immense size and weight, measuring from three to four feet in length; the neck is strong; the limbs clean and firmly knit; and the whole figure displays great power and vigour. See sketch on p. 405. Our own stag and fallow deer, we know, are often engaged in the most desperate contests, and Dr. Richardson states, that "two male Wapitis were found near Edmonton House lying dead, with their horns locked into each other; and

the moose and reindeer are reported to have occasionally died under similar circumstances."



The flesh of the Wapiti is dry and hard, but the skin makes the most valuable leather, preserving its suppleness even after it has been saturated with water. On this account it is much prized by the native Indians.

The Wapiti thrives in our climate, and might no doubt be easily naturalized. The Indians are said to use it as a beast of burden, or for the purposes of draught. In 1822, Mr. Bullock exhibited a pair of these animals, which drew a tilbury admirably, and were gentle and tractable.

There are several fine specimens in the Gardens of the Zoological Society; and also of another fine species of this group, the SAMBOO, *(Cervus hippelaphus,)* a native of Bengal, and of the larger islands of the Indian Archipelago. The Samboo is perhaps a little larger than our stag; its hair is coarse and harsh,

and of a dull brown; the horns are of moderate size, having sharp brow-antlers, and dividing at the extrêmity into two snags. The Samboo is bold, strong, and active.

The AXIS DEER, (*Cervus Axis,*) another of this tribe, is a beautiful and gentle creature, abounding in the plains of India, along the Ganges, and in the islands of the Archipelago. Notwithstanding its eastern origin, it bears our climate well, and with care would soon stock our parks and preserves. In size, form, and colour, it is very similar to our spotted fallow deer; but the horns are not palmated; their stem is rough and cylindrical, and gives off only two snags: one, the brow-antler; the other thrown off considerably higher, and from the inner side of the stem. The spots also are more regularly disposed in lines: a broad dusky mark occupies the forehead, and a line of the same colour extends down the middle of the nose.

Europe, besides the Red and the Fallow Deer, produces also the ROEBUCK, once common in the British isles, but now lingering only among the highlands of Scotland. The Roebuck belongs to a group distinguished by short sessile horns, (that is, having the base but little elevated,) without brow antlers, but dividing at the extremity into three snags or branches.

This graceful and active deer is the smallest of the European species, being little more than two feet high. Its form is light, and its motions surprisingly rapid. When hunted, says Bewick, " it endeavours to elude

its pursuers by the most subtle artifices: it repeatedly returns upon its former steps, till by various windings it has entirely confounded the scent. The cunning animal then by a sudden spring bounds to one side, and, lying close down upon its belly, permits the hounds to pass by without offering to stir."

The Roebuck associates in small families, and requires a wide tract of wild uncultivated ground for its domain. It is both timid and impatient of restraint, delighting to wander at large over moor and mountain, in whose solitudes it finds a peaceful asylum. The colour of this animal is gray, with a tinge of yellow, and with white haunch marks; the ears are large; the tail is short, the lachrymal fossæ wanting. The horns are shed at the end of autumn, and renewed in winter, while in the stag they are shed early in the spring, and renewed with the advance of summer.

The venison of the Roebuck is in high request, but seldom to be obtained: it exceeds in flavour even that of the fallow deer.

The last deer we shall adduce in illustration of the genus is the Muntjak of India, *(Cervus Muntjac,)* which forms the example of a section having short simple horns, rising from a footstalk, apparent beneath the skin, and running obliquely upwards, one on each side of the forehead, beginning as low down as the inner angle of the eye. These two projecting lines down the face have occasioned some authors to give the animal the name of the Rib-faced Deer. The muzzle is slender and pointed; and there are two

sharp canine teeth, one on each side, in the upper jaw of the male.

The Muntjak is one of the most elegant and beautiful of its race: in stature it is small; but its eyes are large and brilliant; its ears expanded; its hair close and shining, and of a dark reddish fawn colour; and its limbs slender and agile. A beautiful specimen from the Dukhun, India, is in the collection of the Zoological Society. Its manners are free and confiding, and as gentle as graceful.

In the Proceedings of the Committee of Science and Correspondence of the Zoological Society, vol. i. p. 104, Col. Sykes observes, that it is called "*Baiker*" among the Mahrattas. It is, he adds, "a native of the Western Ghauts of Dukhun, and is never seen on the plains. It has large suborbital sinuses," which it uses apparently for the purpose of smelling, dilating them to a great extent, and applying them to various objects; as is also the case with the Common Antelope of the plains, (*Antilope cervicapra.*)

We thus close our selection of the examples of this beautiful genus, which pre-eminently displays the power of an Almighty hand, and which no one can regard without interest and admiration. If no portion of His works are devoid of that which claims our regard and leads to the consideration of their Maker, surely such as, from their nature and elegance, are most gratifying to our feelings, and draw from us involuntary expressions of delight, must cause the mind to revert to their great origin, who is glorious

" in the beauty of holiness," and " dwelleth in light unapproachable."

Our next genus is that of *Camelopardalis,* and it contains but one species as hitherto recognised, the celebrated GIRAFFE, or Cameleopard, (*Camelopardalis Giraffa,* GMEL.) It is needless to enter into a detail



of generic characters separate from a description of the species where single, and especially when those characters are necessarily involved in the account.

In looking at the Giraffe, we are immediately struck

with the singularity of its proportions; so different from what we have admired in the graceful stag, whose movements are all elegance and ease. We see a tall long-necked creature, with a short trunk raised on slender elongated limbs, walking along with rapid steps, devoid of grace or springiness; but when we compare these proportions with the native habits of the animal, we shall at once trace the connexion, and discover beauty where we almost began to fancy deformity. The head, as has been often noticed, is the most elegantly moulded part of the whole. It is small, and tapers to a singularly narrow muzzle, with a well formed mouth. The eyes are of large size, prominent, soft, and gentle in their expression. Between the eyes the frontal bones form a projection more apparent in the male than in the female. The ears are large and spreading; the lips, especially the upper one, are very moveable; but the tongue has this power of mobility increased to an extraordinary degree, accompanied at the same time with the faculty of extension, so as in fact to enable it to perform the office of the proboscis of an elephant in miniature; it is indeed an instrument of indispensable use in procuring food. The Giraffe feeds upon the leaves, twigs and shoots of lofty trees, and especially of a species of mimosa; coiling its tongue round the branches, it draws them down between its flexible lips, and nips off the tender portions. This instrument, analagous to the long nose of the tapir, is black, and tapers to a point, capable, it is said, of being inserted into a ring. The senses, especially of sight, hearing, and smell, are acute and delicate. The

head is supported at the extremity of a long, slender, flexible neck, down the back of which to the shoulders runs a short thin mane.

Both sexes have horns, horns not like those of the stag, periodically shed and renewed, nor yet like the true and permanent horns of the antelope, covered with a corneous layer, but horns permanent, short, and always covered with hairy skin. These are useless as instruments of defence; in short, they are neither more nor less than the protuberances or footstalks of the frontal bones, which we pointed out as formed on the deer to be the base from which the future antlers were to spring. It would seem as if nature, having prepared the footstalks, was then arrested in the operation and forbidden to complete her intentions; nay, her process as far as it is carried on is feeble, for these protuberances are by no means remarkable for bulk, and at first united to the frontal bones by suture, are not fairly anchylosed till at an advanced period. To what are we to attribute this imperfection of developement? It is to be sought for in the state of the circulation of the blood in the arteries of the skull. Look at the neck of the Giraffe; slender, swanlike, elongated, and raised up perpendicularly. Along this the arteries have to pass, conveying the blood to the head against the laws of gravitation. The circulation is necessarily impeded; the vital stream ascends with difficulty, and, instead of rushing in free tides volume after volume, as it does in allied mammalia with necks shorter and carried more horizontally, or even in a depressed attitude, and that for hours together, as in grazing the verdant

turf, it is transmitted more slowly, and in quantity more moderate; it permeates the arterial branches with less energy, nor is it adequate to a supply of osseous matter remarkable either for abundance or rapid elaboration. But are we to call all this a defect? No; it is as it should be. Give the long-necked Giraffe the heavy oppressive horns of the elk or the wapiti, and what would it do with such ponderous instruments? They would paralyze every movement; they would catch among the branches; they would be obstacles perpetually in the way, and as weapons they would be worse than useless; for how could that long slender neck wield such engines of warfare? All is well ordered; the relationship of parts and purposes, of organization and habits, is never lost sight of. It is not for nothing that the neck is elongated, that the head is light, and the tongue made flexible; it is not without design that the horns are rudimentary; for such modifications the instincts and habits of the creature demand; the one part involves the other.

To support the neck of the Giraffe, we see the withers elevated, the spinous processes of the vertebræ being drawn out to meet the elastic ligament, *(ligamentum nuchæ,)* which runs along the cervical column in order to assist in retaining it in its natural position. At first sight we are inclined to suppose the legs to be of unequal length, those before seeming unduly elongated. This disparity is, however, not real, and appears so only in consequence of the great elevation of the withers, and the preponderating bulk of the anterior part of the body; indeed the line down the back from the withers to the haunches is so oblique as

to constitute a most marked character in the general contour of the animal.

The hair of the Giraffe is short and close, the ground-colour being a light grayish fawn, marked universally with large triangular spots of brown, or brownish black, arranged with a certain degree of order and regularity and approaching pretty closely together. The tail is furnished with a long black tuft at the tip. The Giraffe inhabits the interior of Africa, frequenting the wooded plains and hills that skirt the arid deserts, or the verge of mighty forests, where groves of mimosa trees beautify the scenery. The range of its habitat is, however, very extensive: it occurs in Nubia and Abyssinia, and the adjacent regions east of the great desert, whence it spreads southwards over central Africa, till we approach the boundary line of the settlements of the Cape. He that would seek for it, however, must leave the haunts of man, and penetrate pathless wilds, traversed only by the quivered bushman, wide wastes, where the grim lion prowls, and the wolf, and the hyæna, and the wild dog hunt their prey. Here man is the enemy least to be feared; but the Giraffe often falls before the lion, though not without resistance; for, rendered desperate by necessity, it uses its hoofs as weapons, striking both with the fore and hind feet with rapid and impetuous violence, so that sometimes it is said to be successful, and still oftener will it bear away its ferocious antagonist clinging on, with teeth and talons, before sinking prostrate in death. The following lines, by Mr. Pringle, have often been quoted; but they are

so spirited and descriptive, that we cannot refrain from presenting them to our reader:—

" Would'st thou view the lion's den?
Search afar from haunts of men;
Where the reed-encircled fountain
Oozes from the rocky mountain,
By its verdure far descried
Mid the desert brown and wide;
Close beside the sedgy brim
Couchant lurks the lion grim,
Waiting till the close of day
Brings again the destined prey.

" Heedless at the ambush'd brink
The tall Giraffe stoops down to drink:
Upon him straight the savage springs
With cruel joy!—The desert rings
With clanging sound of desperate strife,
For the prey is strong, and strives for life;
Now plunging tries with frantic bound
To shake the tyrant to the ground;
Then bursts like whirlwind through the waste
In hope to 'scape by headlong haste;
While the destroyer on his prize
Rides proudly, tearing as he flies.

" For life the victim's utmost speed
Is mustered in this hour of need;
For life, for life, his giant might
He strains and pours his soul in flight,
And mad with terror, thirst, and pain,
Spurns with wild hoof the thundering plain.

" 'Tis vain! the thirsty sands are drinking
His streaming blood; his strength is sinking;
The victor's fangs are in his veins;
His flanks are streak'd with sanguine stains;
His panting breast in foam and gore
Is bathed. He reels! his race is o'er.

He falls! and with convulsive throe
Resigns his throat to the raging foe,
Who revels 'midst his dying moans;
While gathering round to pick his bones,
The vultures watch in gaunt array,
Till the gorged monarch quits his prey."

Naturally gentle, timid, and peaceable, it is only when urged by despair that the Giraffe attempts resistance, and then it is with a resolution and energy proportioned to its great strength. When pursued, the animal bounds along with such rapidity as to outstrip the fleetest horse. Some have said its paces are awkward, and that the Giraffe is soon exhausted by its speed. We suspect this to be one of those theories which have no other foundation than supposition; for Le Vaillant, in his lively account of one which he pursued during his residence in Great Namaqua-land, and which he describes as proceeding at a "smart trot," and "not at all hurried," says, "We galloped after her, and occasionally fired our muskets, but she insensibly gained so much upon us, that having pursued her for three hours we were forced to stop because our horses were quite out of breath, and we entirely lost sight of her." The next day he saw five giraffes, to which he gave chase, but which, after a whole day's pursuit, he lost sight of as night came on. The next day he fell in with seven, one of which he followed on horseback at full speed, but which left him in the distance, and was lost sight of; the dogs, however, resolutely continued the chase, and afterwards brought the creature to bay, surrounding it, but not venturing to make an attack, as it defended itself with

a "succession of rapid kicks." In the mean time, the narrator came up, and killed it by a shot.

The Giraffe is one of those animals with which, until the last forty years, we were less acquainted than the ancients, whose accounts have been received with doubt, or even incredulity. In Calmet's Fragments, No. CCLXXXVIII. the 3d hundred, the writer expresses an opinion that the *Zamor* of Moses is not unlikely to be the Cameleopard or Giraffe, which he thinks must have been known to the Egyptians, and therefore to the Israelites while sojourning in their land. Bochart translates the word, "rock-goat," supposing the Giraffe did not exist in the adjacent north-eastern regions. Now what the word Zamor ought to be translated, we do not pretend to say; but we cannot for a moment doubt that the Egyptians were well acquainted with an animal occurring in the present day in Abyssinia, and perhaps existing formerly, if analogy may be our guide, even nearer the limits of the kingdom of the Pharaohs. It is not a little singular that the only Giraffe ever seen alive in England was sent, in 1827, by the Pacha of Egypt, as a present to his late Majesty, George IV.; another also being at the same time sent to Paris. These two individuals were obtained while young by some Arabs a few days' journey south of Sennaar, in Nubia, near a mountainous and wooded district, and fed with camels' milk. By command of the Pacha, they were removed by gradual stages to Cairo, and thence by the Nile in boats to Alexandria, where they were shipped for their ultimate destinations. The one sent to Paris, and which was much the finest, is still alive; the

other in a short time after its arrival in England began to manifest symptoms of debility, which increased notwithstanding the utmost care, and it died in 1828. The preserved skin and skeleton were presented by their royal owner to the Zoological Society of London, and now grace their splendid Museum.

Retracing the annals of Europe, we find that about the end of the fifteenth century the Soldan of Egypt sent a present of a Giraffe to Lorenzo di Medici, and that it was familiar with the inhabitants of Florence, where it was accustomed to walk at ease about the streets, stretching its long neck to the balconies and first floors for apples and other fruits, upon which it delighted to feed.

The Giraffe was well known in ancient Rome. The first appears to have been exhibited in the dictatorship of Julius Cesar; subsequently several of the emperors exhibited it in the games and processions; and Gordian the Third is said to have possessed ten at the same time.

Now, as Southern Africa was a *terra incognita* to the Romans, we have reason to conclude that every example was obtained from the northern or north-eastern line of that vast continent, and most probably by way of Egypt; hence we may well believe that it was known in Egypt at an era more remote, and to the nations communicating with that then mighty empire.

The height of the full grown Giraffe, from the hoofs to the head, is about eighteen feet; but the females are smaller. The specimen of the young female in the Zoological Museum is about thirteen feet.

The first specimens were brought to England by that enterprising traveller Mr. Burchell, and are preserved in the British Museum; they were obtained in South Africa. The largest measures seventeen feet six inches. The word *Giraffe* is a corruption of the Arabic "*Zirafe*."

We now enter upon a multitudinous assemblage of animals united into one great genus by common characters, but which, for the sake of preventing confusion, systematic writers have endeavoured to subdivide into minor groups, taking the unimportant characters of the horns, their shape, and direction, as the grounds of their sections. Characters, however, like these can hardly be relied on, nor indeed ought they to have been chosen, could data, essentially connected with structure, have possibly been obtained; as it is, they must at present stand in the stead of a more scientific basis. These sections, thus artificially formed, we shall pass over without any explicit notice, because, as we cannot give even a sketch of every species, they would be of no service, and because if we were to dwell upon them, they would add nothing to our real information. This genus then is that of the ANTELOPES, (*Antilope.*)

The Antelopes are distinguished at once from the preceding genera by their true and permanent horns. Internally they consist of a solid osseous protuberance of the frontal bone, covered externally by a sheath of true horny matter, which increases by the addition of successive layers in proportion to the growth of the internal nucleus. The solidity of this nucleus of bone

is a character worth noticing, inasmuch as it is one of the distinctive marks between the Antelopes and the Goats, which latter, in addition to the compressed form of the horns, have the bony nucleus hollow and communicating with the frontal sinuses.

The horns of the Antelopes are simple; they are generally, though not always, peculiar to the males alone, and are always rounded. Many are marked with raised circular rings, continued more or less throughout their whole length; some are spirally twisted, others encircled by a spiral line; some are perfectly straight, others are hooked forwards, others backwards, others by their junction form a lyre; in short, the modifications of their outline are almost innumerable.

The remaining characters of the genera are such as bring them in close alliance with the genus *Cervus*. Gracefully and elegantly formed, their body is supported on light and slender but vigorous limbs, constructed for the utmost speed, the hinder being the longest, and the haunches being elevated accordingly. In many species we find a tuft of hair below the knees. The hoofs are long, narrow, and pointed; the head is generally small, and its contour beautiful; the eyes are large, full, and brilliant; the ears large, open, pointed, and moveable. The suborbital sinuses are generally large, and capable of contraction or expansion; the hair is usually sleek and close. This interesting genus is almost peculiar to the hotter countries of the Old World, Africa and Asia. One, the Chamois, is found in Western Europe, and two or

three species imperfectly known, are natives of the American continent.

In habits and manners the Antelopes offer but little variety. Fleet as the wind, they scour the plains in herds, bounding along when scared by the approach of man or beast with a lightness and grace absolutely unrivalled. Timid and gentle, they have but their speed to trust to for escape; and they are therefore endowed with the senses of hearing, sight, and smell, in exquisite perfection: the sense of taste also is singularly delicate.

Were these creatures not thus gifted, were not their limbs thus strong for flight, and their senses thus acute, how would they escape their foes? As it is, multitudes fall. The leopard, the tiger, and the lion lurk for them in every thicket; and man joins the number of their devoted enemies, training the eagle and the cheetah for the chase. But, like all creatures whose weakness renders them a prey to the ferocious, their increase bears a relative proportion to their diminution, and though thousands yearly fall to glut the prowlers of the forest, their loss is yearly supplied.

Some few of the larger species, it is true, make a desperate stand in self-defence even against the lion, and, nerved by despair, use their sharp horns with surprising energy. Still the struggle is unequal, and the race would soon perish were its recruits not adequate to its losses.

The Antelopes are not restricted to one kind of locality; the jungles, the wide and open plains, the morasses, the forest, and the mountain-tops, are re-

spectively the habitat of different species; but every where they retreat as human society advances; the wilds, the solitudes, and the deserts are their home.

* * * * * * * *

"Afar in the desert I love to ride,
With the silent bush-boy alone by my side,
Away, away, from the dwellings of men,
By the wild deer's haunt, by the *buffalo's* glen;
By valleys remote, where the *oribi* plays,
Where the *gnu*, the *gazelle*, and the *hartebeest* graze,
And the *gemsbok* and *eland* unhunted recline,
By the skirts of gray forests o'erhung with wild vine;
Where the elephant browses at peace in the wood,
And the river-horse gambols unscared in the flood;
And the mighty rhinoceros wallows at will
In the v'ley* where the wild ass is drinking his fill.

"Afar in the desert I love to ride,
With the silent bush-boy alone by my side;
O'er the brown karroo, where the bleating cry
Of the *springbok's* fawn sounds plaintively,
Where the zebra wantonly tosses his mane
As he scours with his troop o'er the desolate plain,
And the timorous guagha's whistling neigh
Is heard by the fountain at fall of day,
And the fleet-footed ostrich over the waste
Speeds like a horseman who travels in haste,
Hying away to the home of her rest,
Where she and her mate have scooped their nest,
Far hid from the pitiless plunderer's view,
In the pathless wilds of the parched karroo."

* * * * * * * * *

PRINGLE.

We shall proceed to illustrate the present genus by a few examples; and first, the GAZELLE, (*Antilope Dorcas*, LIN.) The light Gazelle, with its beaming

* *V'ley*, marsh in the language of the colonists.

eye and graceful figure, has been ever a favourite with the poets of the east, from whose writings it has been borrowed into the pages of northern bards.

Under the name of the *Roe* we meet with many beautiful allusions to this animal in the sacred writings. It is common over the whole of the north of Africa; it abounds in Arabia and Syria.

> "The wild Gazelle o'er Judah's hills
>   Exulting still may bound,
> And drink from all the living rills
>   That gush on holy ground."

The Roe is still "swift on the mountains" of a land whose glory is departed, the land of prophecies and miracles, the land of the Redeemer, where he was despised and rejected; over its nameless and desolate ruins the Gazelle may bound unnoticed, save by the prowling hyæna or yelling jackal.

The Gazelle is about twenty-four inches in height; its skin is of a beautiful light fawn on the back, passing into a brown band along the sides, which forms an abrupt border to the white of the under surface. The horns, which are lyre-shaped, have twelve or fourteen rings; they occur in both sexes, and by their form distinguish the group of Antelopes to which this species belongs, a group taking from it the name of the *Gazelles*.

Another very beautiful animal of the same group is the SPRINGBOK of Southern Africa, (*Antilope euchore*, BURCHELL.) The Springbok is larger than the gazelle; the general colour of its upper parts is fawn; the

under surface is white, abruptly bordered along the sides with a rich chestnut band; the horns are of



moderate length and lyriform. The distinguishing mark of this species is a line of very long white hairs arising from between a double longitudinal fold of the skin along the middle of the back; in the ordinary state the edges of this fold approximate and lie close, so as to conceal in a great measure this snowy stripe. It is, however, expanded, so as almost to occupy the whole of the haunch when the animal takes those extraordinary leaps which first suggested its name. Mr. Burchell thus describes the effect produced by the appearance of a herd of these beautiful creatures. "At this high level we entered upon a

very extensive open plain abounding to an incredible degree in wild animals; among which were several large herds of *quakkas*, and many *wilde-beests* or *gnues*, but the *springboks* were far the most numerous, and, like flocks of sheep, covered several parts of the plain. Their uncertain movements rendered it impossible to estimate their number; but I believe if I were to guess it at two thousand, I should be still within the truth. This is one of the most beautiful Antelopes of Southern Africa, and it is certainly one of the most numerous. The plain afforded no other object to fix the attention; and even if it had presented many, I should not readily have ceased admiring these elegant animals, or have been diverted from watching their manners. It was only occasionally that they took those remarkable leaps, which have been the origin of their name; but when grazing, or moving at leisure, they walked or trotted like other antelopes, or as the common deer. When pursued or hastening their pace, they frequently took an extraordinary bound, rising with curved or elevated backs high into the air, generally to the height of eight feet, and appearing as if about to take flight. Some of the herds moved by us almost within musket-shot; and I observed that in crossing the beaten road, the greater number cleared it by one of those flying leaps. As the road was quite smooth and level with the plain, there was no necessity for their leaping over it; but it seemed that the fear of a snare, or a natural disposition to regard man as an enemy, induced them to mistrust even the ground which he had trodden."

The most interesting part of the history of the

Springbok relates to its occasional migrations from the interior to the cultivated districts of the colonial settlements of the Cape. South of the Orange River is an immense desert tract destitute of permanent springs, and therefore uninhabitable by man, but still interspersed with pools of brackish water, replenished by the periodical rains, which satisfy the wild beasts of this almost uninvaded realm. Here, with others of their race, myriads of Springboks dwell in peaceful security. At length comes a season of drought; no thunder-storms replenish the pools; every reservoir is dried up; the ground is parched; every green thing withers, and is, as it were, burnt away by the scorching sun: one scene of barren desolation extends around. Driven by necessity, these swarms, countless as the sands, inundate the surrounding regions, seeking more fertile plains and unexhausted springs. Some pass to the borders of the Orange River and its tributary streams; others southwards, ravaging like locusts the fields of the colony, and destroying the hopes of the year. Mr. Pringle says he has seen them literally whiten the face of the country "as far as the eye could reach over these far-stretching plains." They do not, however, approach the precincts of man with impunity; they are destroyed by thousands for food; they are harassed on every side; but still pursue their course. Let, however, the rains return, and, warned by their instinct that vegetation has recommenced in the desert, and that the pools are filled, they rapidly retrace their steps, and in a few days, as if by magic, not a Springbok is to be seen.

Referring to the migrations of these animals, Captain Stockenstrom, chief civil commissioner at the Cape, thus writes to Mr. Pringle. "It is scarcely possible for a person passing over some of the extensive tracts of the interior, and admiring that elegant animal the Springbok thinly scattered over the plains and bounding in playful innocence, to figure to himself that these ornaments of the desert can often become as destructive as the locusts themselves. Incredible numbers which sometimes pour in from the north during protracted droughts distress the farmer inconceivably. Any attempt at numerical computation would be vain; and by trying to come near the truth, the writer would subject himself in the eyes of those who have no knowledge of the country to a suspicion that he was availing himself of a traveller's assumed privilege. Yet it is well known in the interior, that, on the approach of the *Trek bokken,* (as these migratory swarms are called,) the grazier makes up his mind to look for pasture for his flocks elsewhere, and considers himself entirely dispossessed of his lands until heavy rains fall. Every attempt to save the cultivated fields, if they be not enclosed by high and thick hedges, proves abortive. Heaps of dry manure (the fuel of the *Sneeuwbergen* and other parts) are placed close to each other round the fields, and set on fire in the evening, so as to cause a dense smoke, by which it is hoped the antelopes will be deterred from their inroads; but the dawn of day exposes the inefficacy of the precaution, by showing the lands, which appeared proud of their promising ver-

dure the evening before, covered with thousands and reaped level with the ground. Instances have been known of some of these prodigious droves passing through flocks of sheep, and numbers of the latter carried away with the torrent, being lost to the owners, and becoming a prey to the wild beasts. As long as these droughts last, their inroads and depredations continue, and the havoc committed upon them is of course great, as they constitute the food of all classes; but no sooner do the rains fall than they disappear;" no doubt to return to their native wilds, where, if the food be coarse and the water brackish, they, at least, are seldom visited by man, and enjoy some degree of exemption from his incursions. The Springbok is easily tamed, and is playful and familiar when domesticated. A most exquisite specimen exists in the choice Museum of Mr. Steedman.

Of another group of Antelopes distinguished by horns spirally convoluted and ringed, and occurring only in the male, we may notice the INDIAN ANTELOPE, *(Antilope Cervicapra.)* This beautiful Antelope is generally spread through India, associating in small herds under the guidance of an experienced male. It is called "*Bahmunnee Hurn*" by the Mahrattas, and abounds in scores of flocks over the plains of the Dukhun. Timid and suspicious, they are easily alarmed, and by their rapidity and the extraordinary length of their bounds escape the fleetest dogs. In captivity, however, as seems to be the case with all the antelopes, they become familiar and even bold; and, as they have manifested much hardiness in

bearing our winters, might with care be added to the ornaments of our parks.

The usual mode of chasing the Antelope is by means of the cheetah or hunting leopard, which creeps catlike towards the herd, and bounding upon a selected victim, dashes it to the ground with a blow. The falcon is also trained to baffle them as they scour the plain, and by thus impeding their celerity give the dogs a chance. In size the present species equals a fallow deer; its general colour above is a brownish fawn, approaching more or less to black, and abruptly edging the white of the under surface; there is a broad patch of white on the buttocks, and an almost complete and pretty broad circle of white surrounds the eye. The colour of the upper surface in the female is lighter.

The CHIRU ANTELOPE, (*Antilope Hodgsonii*, ABEL,) may here be noticed. It is a native of Tibet, and, like all the animals of that country, possesses an under fleece of fine and soft wool. The hair forming the external coat is two inches long, harsh, feeble, and very closely set. The colour of the animal is fawn red above, and white on the under parts; but every hair at a little distance from the top loses the red and assumes a bluish gray. The forehead is black, and a fringe of the same colour passes round a fleshy or rather skinny protuberance close to the outer margin of either nostril, and as large as half of a fowl's egg. The height of this species is about two feet eight inches at the shoulder. It is "highly gregarious, being," says Mr. Hodgson, "found in herds of several

scores, or even hundreds. It is extremely wild and unapproachable by man, to avoid whom it relies chiefly on its wariness and speed; but, though shy, it is not timid, for if overtaken it meets danger with a gallant bearing. It is said by some to inhabit the plains of Tibet generally, while according to others it is confined to those plains which are within sight of mountains, especially of the Hemâchal mountains. It cannot bear even the moderate heats of the valley of Nêpâl; an individual belonging to the Lama of Digurchee having died at the commencement of the hot season, when the maximum of temperature was only 80°, a temperature seldom reached for two hours a day, or for two days of that month, March.

"The *Chiru* is extremely addicted to the use of salt in the summer months, when vast herds are often seen at some of the rock salt-beds, which so much abound in Tibet. They are said to advance under the conduct of a leader, and to post sentinels around the beds before they attempt to feed."—Vide *Proceeding of Committee of Science, &c. of Zool. Soc. L.* vol. i. p. 52—3.

The horns are long, often measuring two feet and a half, and ringed to within six inches of the tip. Their general outline is straight, bending rather forwards, and outwards, and becoming suddenly incurved at their points.

To the group with ringed horns having a double bend, with the points directed backwards, we may refer the CERVINE ANTELOPE (*Antilope bubalis.*) This

species is a native of Northern Africa, living in small troops in the deserts. It is common in Barbary, and



is even found on the borders of Egypt. Its proportions are not distinguished for that grace and lightness which characterizes the genus in general; the head is large, very elongated, and narrow; the shoulders are high, the limbs stout; the horns are heavy, and nearly touch each other at their base; their first direction is backwards, then making an angle they bend forwards, and lastly with another angle bend their points backwards.

In size the Cervine Antelope equals a stag; the colour is one uniform yellowish red or fawn, with the exception of the tail, which is tipped with a black tuft. From the heaviness of its figure it has acquired the name of "*taureau cerf*," and "*vache de Barbarie*."

Closely allied to this species is the HARTEBEEST of Southern Africa, (*Antilope Caama*, CUV.) having its horns still more angular, and a black mark encircling their base; there is also a mark of the same colour on the forehead; a line along the neck and down the front of the limbs, and the tuft of the tail, are black.

The group of Antelopes with long pointed horns, straight, or slightly curving backwards, ringed, and occurring in both sexes, is represented by the ORYX, (*Antilope Oryx*, PALL.) of southern, and the ALGAZEL of northern Africa.

The Oryx, one of the most splendid of antelopes, is a native of the regions of Southern Africa: it is as large as a heifer, and its horns often measure three feet in length; they are straight, pointed, round, and obliquely ringed for two-thirds of their extent, becoming smooth towards the points. In the female they are smaller. The colour of the Oryx is dull gray, tinged here and there with a slight wash of reddish, and becoming white below; there is a chestnut spot on each shoulder and on each thigh, a black band with the hairs reversed runs along the spine, another occurs on each flank and above the hoofs; the tail is long and blackish; the head is white, with a large black mask on the forehead, and two lines of the same colour across each cheek, so as to produce somewhat of a piebald appearance.

The Oryx is heavily made, having short stout limbs, a large round body, a thick and muscular neck, and a large head devoid of grace or animation. Of its habits

little is known. Cuvier says it frequents mountain districts; Mr. Steedman, however, met with it in the



Karoo, or flat desert, south of the Orange River; whence the specimens were brought which adorn that gentleman's collection. It would appear to be resolute and dangerous when hard pressed; one of the individuals referred to having wounded three of the dogs which surrounded it before it was shot; it used its horns with amazing address and energy, and made a bold and gallant self-defence, striking right and left with prodigious violence, so as to keep the whole pack at a due distance. From the size and heavy make of this species, we should much question the fact of its

mountain habitat, as large and ponderous animals seldom inhabit regions where their bulk would preclude a necessary degree of activity, independently of the scanty food such situations afford. Its hoofs are short and thick.

It will be perceived that in the figure which we have given of this animal a single horn only is represented, as a single horn only appeared in the position in which the sketch was taken. In the sculptured monuments of ancient Egypt and Nubia, the Oryx or the Algazel is thus delineated, and frequently also with a single leg before and behind, either because such only appeared to the artist, or because he aimed at giving in bas-relief a longitudinal section of the animal. However this may be, it is not improbable that the circumstance has given rise to the *fabulous unicorn,* fancy having added other details. We mention the *fabulous unicorn,* because our readers will remember that there is a unicorn alluded to in the sacred writings, which we cannot allow to have been the Oryx, and for this reason: it is spoken of as the *monoceros,* a creature having truly a single horn; whereas, erroneously as the Oryx may have been represented on Egyptian monuments, we are not to suppose the writers of the scriptures were also as erroneous in their description, (for the *name itself is a description* in one great point,) but that they alluded to an animal really in nature. Such do we conceive to be the rhinoceros, and we refer our readers to our observations on that extraordinary creature.

We shall now give the head of the Oryx in another point of view, showing the two horns as they exist, so

that our readers will not be misled by the supposition that the Oryx is a *one-horned antelope.*



Allied to the Oryx, if indeed it be not a mere variety, is the ALGAZEL, (*Antilope leucoryx*, LICHT.) the Oryx of Northern Africa, where it is found from Nubia to Senegal. Its horns are slightly curved, long, slender, and ringed; the colour of this animal is whitish, tinged more or less with yellow or reddish; a lively spot of yellowish brown extends before the root of the horns, and also down the forehead. Whether the ancients distinguished this from the preceding species or not, is perhaps uncertain; nor indeed, granting this to be the only species with which they were acquainted, and consequently the true Oryx, would it invalidate our observations above; inasmuch as both animals, if not absolutely identical, which is yet a query, are intimate relatives.

In a genus so multitudinous we must necessarily pass over several interesting forms and species: we shall therefore proceed to give an example of a group

with short, straight, and smooth horns, which the males alone possess. The NYL GHAU, (*Antilope picta*, PALL.)

The Nyl Ghau is superior to the stag in stature, and more muscular and powerful, but less graceful in its proportions. The fore-quarters are considerably elevated, and this elevation is increased by a slight hump on the withers; the haunch is small and low; the limbs are stout and strong; the neck is long and of considerable thickness; the head is large, and the muzzle narrow; the eyes are full, large and prominent; the horns are conical, and seven or eight inches in length.

The male and female differ considerably in colour, and also in size, so that they might absolutely be mistaken for different species. The general colour of the male is a dark bluish slaty gray; two white spots occur on each cheek; and a white patch occupies the throat for some extent; the legs are also marked by a white band just above the hoofs in front, and another smaller round the fetlock joint. A bunch of long pendent black hairs arises from the fore part of the neck, and a similar tuft terminates the tail, which is of unusual length.

The female is much smaller, lighter, and more slender, with less difference between the height of the fore and hind quarters, and less hump on the withers; her colour is a pale reddish brown, but with the same white markings as in the male.

The Nyl Ghau is a native of the north-western provinces of India, and the countries between these and

Persia, where, according to some accounts, it is very abundant. Of its habits in a state of nature we have little or no information. In captivity it is familiar and gentle, but somewhat capricious; and we have frequently seen it menace in a most determined manner: still, however, it is fond of being noticed and caressed. The first pair of Nyl Ghaùs seen in England were sent from Bombay to Lord Clive in 1767, if we except one noticed in the 43d vol. of Phil. Transactions, by Dr. Parsons, as a nameless "Quadruped brought from Bengal;" and of which he gave an imperfect figure. There are several beautiful specimens of this interesting antelope in the Gardens of the Zoological Society, London.

We have often observed that no race of animals is so isolated as not to present grades or links uniting it at certain points with other races. The antelopes present many of these links, of which we shall select two, with which to close our sketch of this numerous genus. And, first the GNU, (*Antilope Gnu*, GMELIN.) Naturalists have always regarded the Gnu as an animal exhibiting a compound of characters each peculiar to some other animal; and hence different opinions have been formed as to its true situation. Zimmerman placed it among the ox tribe, under the name of *Bos gnou*. Mr. Smith places it in a new genus under the name of *Catoblepas*, supposing it to be the animal to which Pliny* refers under that title. Most authors

* See Lib. viii. ch. 32; and Ælian, Lib. vii. ch. 5.

however have assigned it a place among the antelopes, which indeed appears upon the whole to be its most legitimate situation.



The Gnu is certainly an extraordinary animal; its height is equal to that of a small pony; and its general contour very muscular, but compact, and exhibiting great energy. The head is large, the eyes are wild and fiery, the horns large and ponderous, like those of the buffalo, being thick, massive, and close together at their base, scarcely advancing from the skull, and having a direction obliquely outwards, they sweep down with a regular curve, and rise again at the points, which are long and sharp; their situation is such as to overshadow the eyes, producing a sinister and suspicious aspect. The muzzle is large, spread out, and flattened, with narrow linear nostrils; above the muzzle is situated a large tuft of black bristling hairs radiating laterally. The neck is short and thick, and surmounted with a fine, full, upright mane, the

hairs of which are whitish at the base, and black at the tip. Below the neck hangs a dewlap, furnished with bristly hairs, which run up to the throat and form a sort of beard. The body and rounded crupper are not unlike those of a horse, a similarity still farther added to by a long flowing tail of white hairs; the limbs are sinewy and active, like those of the antelopes in general; the colour of the body and limbs is a deep brown verging upon black.

The Gnu is a native of Southern Africa, being principally confined to the hilly districts, where it roams either singly or in small herds. Mr. Pringle observed it among the hills at Bavian's River, and informs us that its flesh in all its qualities closely resembles beef. He also states that, like the buffalo and ox, this animal is enraged by the sight of scarlet, and that "it was one of our amusements to hoist a red handkerchief on a pole and observe them caper about, lashing their flanks with their long tails, and tearing up the ground with their hoofs, as if they were violently excited and ready to rush down upon us; and then all at once, when we were about to fire upon them, to see them bound away, and again go prancing round us at a safer distance." This aversion to scarlet the writer has noticed, and can bear witness to the excitement produced by the sudden display of the scarlet lining of a cloak. The same talented writer adds that, when caught young, the Gnu is reared without any difficulty, becoming as domesticated as the cattle of the farm, with which it associates in harmony, going and returning to pasture; but that few of the farmers like to domesticate it, as it is liable to

some contagious malady, which it communicates to its fellow companions.

In our menageries the Gnu is fierce, bold, and dangerous, striking violently with his horns, and exhibiting astonishing proofs of muscular power and activity. The females are less violent, and more easily manageable. Like the males, they have horns; in size they are rather less. Several splendid specimens of this rare and interesting antelope are in the Gardens of the Zoological Society of London.

If the Gnu leads off to the buffalo or ox, the bounding Chamois is certainly the link between the antelopes and the goats: indeed, Blanville has placed it in an intermediate genus under the name of *Cervicapra.*

Retaining it, however, provisionally among the antelopes, we may observe that the CHAMOIS, or Ysard of the Pyrennees, *(Antilope rupicapra,* LIN.) is the only species of the present extensive genus which is a native of western Europe; and there it is found only among the inaccessible cliffs of the high regions of the Alps and Pyrennees, below the line of perpetual snow. In these elevated districts the Chamois dwells in small herds, feeding upon the herbage of the sloping mountain sides, and protected by a sentinel placed on some adjacent rock which commands a view of every way of approach. When man or a beast of prey appears, he makes a loud hissing noise, as a warning of danger at hand; the herd then run towards him to ascertain its nature, and be certain that the alarm was not needless; they gaze a moment; is it a hunter, and well they know their

most formidable destroyer, off they bound from ledge to ledge, where the eye can mark no footing, from crag to crag, from point to point; they clear the chasm, they sweep over the glacier, they throw themselves down the precipice, pitching as if by miracle on the slightest projection. The foe still follows. Away to the summits of the Alpine peaks, over snows and ice, by precipices of fearful depth, over fathomless abysses, up rocky barriers which rise like the walls of a citadel, on they bound straining every nerve for safety. But notwithstanding all their vigilance, all their speed, all their artifices, and the rocky barriers of their mountain home, the hunter's rifle thins their numbers, and the species has for some time been on the gradual decrease. We believe, however, that certain regulations are now adopted in Switzerland by which the race will again multiply.

The hunting of the Chamois is one of the most perilous of human undertakings: no Chamois hunter ever dreams of any other death than that of falling from the brink of a precipice, or of being buried in some chasm beneath the treacherous snow; yet with a knowledge of every danger, and a conviction of the fatal end, no one who has ever embraced this desperate mode of life can give it up; it is in fact a kind of infatuation, produced like that of a gambler by alternate hopes and fears, disappointment and success, each felt in its most intense degree, and keeping up in the mind an excitement to which every other seems poor and insipid. Wherever the Chamois flees, there must the hunter follow, along ledges of rock, by the brink of abysses where the footing is barely sufficient

for the hoof of the animal he chases; up the rugged sides of precipices, where to slip is death inevitably, or from one point of rock to another by a leap which madness would alone attempt; such is his course. All he carries besides his gun is a bag of provisions, an iron-shod staff to assist in climbing or leaping, and an axe to cut steps in the towering parapets of ice; his shoes are furnished with a number of iron points studded over the soles to lessen the danger of slipping: thus provided, he spends days and nights among the mountains, and often returns to his cottage no more.

Some have looked upon such a picture as we have sketched with feelings of admiration and enthusiasm; but more regard it with pity, almost bordering on contempt. We see in it a mere perversion of mental energies capable of better things, and we lament the infatuation of the man who thus follows a pursuit as worthless as it is hazardous. But what shall we say of the men of the world who, ungifted with that courage which the hunter of the Alps displays, seek with an equal infatuation after pursuits equally worthless, more intrinsically sinful, and calling forth the exercise of no mental energies whatever. They and their pursuits are alike despicable. "My soul, come not thou into their secret."

We conclude our account of the Chamois by adding a few details. Its time of feeding is morning and evening, when on the green slopes afar the herd may be often seen with their young ones gamboling like playful kids. The hair of this animal is thick, long, and coarse, serving not only as a protection against cold, but as a provision against the bruises to which

we may conceive the creature to be perpetually liable. Its hoofs are admirably adapted for security, being so formed as to avail themselves of every little roughness or projection, either of the naked granite, or the icy glacier. The horns, rising just above the eyes, are black, smooth, and straight, for two-thirds of their length, when they suddenly curve backwards in a hook. The size of the Chamois is equal to that of a large goat; its colour is dark chestnut brown, with the exception of the forehead, the sides of the lower jaw, and the muzzle, which are white. It can seldom be captured alive, and never thrives in captivity. Like the Swiss, its congenial home is among its native mountains, and in its native liberty.

Closely allied to the chamois of Europe, is the KLIPSPRINGER, (*Antilope oreotragus*, FORST.) of the rocky mountains of the Cape of Good Hope. Its horns, however, are straight throughout their whole length; but the manners and habits of the two species are similar.

From the Chamois we pass by a natural transition to the *goats* and the *sheep;* between which, however the domesticated breeds of Europe may differ, it is impossible to discriminate with any thing like clearness when we leave the cultivated varieties, and refer to the species in their wild and unreclaimed condition. Here those characters on which most naturalists have founded two *distinct genera* vanish. The woolly fleece, which we are apt to fancy as peculiar to the sheep, gives place in the wild races to long coarse hair. The

direction of the horns, on which Cuvier chiefly relies, together with the convexity of the line of the profile, is subject to infinite variety; the beard at most is but a trifling specific distinction, and by no means to be trusted; and, besides all this, the races produce a mixed breed, from whence spring numerous descendants. In fact, it would appear that there are no solid grounds for separating the goats and the sheep into distinct genera. In both we find the orbitar sinuses wanting, in both the osseous core of the horns is hollowed into cells or cavities communicating with the sinuses of the frontal bones, in both the horny laminæ consist of a series of rings, added in succession as the animal increases in size and years.

When we leave the consideration of genera and come to that of species, we find ourselves even more at a loss than ever. Difficult is it to discriminate between animals peculiarly subject to variety produced by food and climate, and exhibiting at the most but slight modifications of character, but still more difficult, granting that the species *be* clearly made out, to know to which we are to look as the origin of our domesticated breeds, which, like the dog, have been the property of the human race as far as the earliest records trace back the history of man; indeed, as with the dog, the question forces itself upon us, Have not these animals been always domesticated, have they not from man's first day's of toil been given to him as essentially necessary to his very existence? The shepherd condition of mankind is allowed to be that of primeval antiquity, as is proved by sacred writ, and supported by the many records and allusions

of classic authors. "Abel was a keeper of sheep," and he "brought the firstlings of his flock" as an offering to God; and the golden ages were those of a pastoral life, when men led their flocks and their herds over the plains and mountains.

However, as Cuvier, while acknowledging how little the separation is warranted, has thrown these races into two genera, we shall so far follow him as to take a glance first at the genus *Capra*, LINN.; that, namely, of the *Goats*, distinguished by the backward direction of the horns, and the concave line of profile.

The WILD GOAT, *(Capra ægagrus,)* is found in herds in the great mountain chains of Asia, where it bounds wild and free. Its size is superior to that of our domesticated breed; and its horns are usually larger, with sharp anterior edges. It is known by the name of *Paseng* in the mountain districts of Persia.

The DOMESTIC GOAT, *(Capra hircus,)* offers like all thoroughly reclaimed animals, over whom man has held a long continued influence, an almost endless number of varieties, as it respects size, colour, and the quality of the hair, nay, even the magnitude and number of the horns. The Goats of Angora and Cappadocia have long been celebrated for their soft and silky hair, forming the staple of the cloth called camlet.

In Thibet there is a breed furnished with an under-coat of wool of exquisite fineness and delicacy; it is from this that the so much valued Cashmere shawls are fabricated. Upper Egypt has a race on the con-

trary with close smooth hair, a convex forehead, and a projecting lower jaw. The Goat is abundant in Syria, where the nature of the pasturage is such as peculiarly befits it, and where it was formerly and is still kept in flocks, tended by keepers of the fold. Numerous are the allusions to it in the holy scriptures, from which we learn that it constituted no mean portion of the wealth of a pastoral people; its flesh was used as food, and its hair wrought into cloth. It was among the animals offered up in sacrifice under the Mosaic dispensation; and who does not recollect the scape-goat? "And he shall *kill the goat* of the *sin-offering* that is for the people, and bring his blood within the vail, and do with that blood as he did with the blood of the bullock, and sprinkle it upon the mercy-seat, and before the mercy-seat," Levit. xvi. 15. "And when he hath made an end of reconciling the holy place, and the tabernacle of the congregation, and the altar, he shall bring a live goat; and Aaron shall lay both his hands upon the head of the live goat, and confess over him all the iniquities of the children of Israel, and all their transgressions in all their sins, putting them upon the head of the goat, and shall send him away by the hand of a fit man into the wilderness; and the goat shall bear upon him all their iniquities into a land not inhabited; and he shall let go the goat in the wilderness," Levit. xvi. 20—22.

The Mosaic dispensation was a type of that which was to come; it sets forth a sacrifice of infinite price to be offered once and for all; one who should bear our sins to a land of oblivion, where they should be

remembered no more against us. Christ is the Antitype of the sacrifice and of the scapegoat; God "hath laid on him the iniquity of us all." Let our readers turn to the ninth chapter of Paul to the Hebrews: "Christ being come an High Priest of good things to come," "neither by the blood of goats and calves, but by his own blood he entered in once into the holy place, having obtained eternal redemption for us," ver. 12. And again, chapter x.: "For the *law* having a shadow of good things to come, and not the very image of the things, can never with those sacrifices which they offered year by year continually make the comers thereunto perfect," ver. 1, ... "for it is not possible that the blood of bulls and of goats should take away sins," ver. 4, . . "but this Man, (Jesus Christ,) after he had offered one sacrifice for sins, for ever sat down on the right hand of God," ver. 12.

To return. Several travellers have noticed a breed of goats in Syria remarkable for the extent and developement of the ears, which hang down so as in fact to touch the ground; and it is not a little curious to reflect upon this circumstance, trivial as it may seem in itself, inasmuch as it throws a light upon the expression of Amos: "As the shepherd taketh out of the mouth of the lion two legs, or a *piece* of an ear," ch. iii. 12. Several goats of this race have come under our own observation: their hair is long and flowing; their horns short, and curling close to the head; the ears of amazing size and thickness. The annexed cut is a spirited representation of the head of one of this celebrated breed, which, with trifling varia-

tions in the length of the ears, appears to be extensively spread throughout the western countries of Asia and the northern line of Africa.



We shall here close our account of the Goat. There is, however, one animal allied to it which requires a moment's notice; namely, the IBEX, *(Capra Ibex.)* The Ibex is found occupying the most elevated points of the higher ranges of the mountains throughout Europe and Asia, but more especially of those of western Asia and the adjacent countries of Europe. In these solitudes it lives in small herds, under the guidance of an experienced leader. In its manners it is much like the chamois, being vigilant and surprisingly active. When hard pressed, it has been known to turn upon the hunter and hurl him down the precipice. The horns of the Ibex are of large size, knotted with a series of elevated rings, and arched gracefully

backwards with a sweeping curve. We have measured some four feet in length, and, it is said, they have been found much larger. The colour of the animal is



grayish yellow above, and dull white on the under parts, with a brown band along the flanks, and a black line down the spine. In winter there is an additional coat of long coarse hair, which is shed as summer comes on, leaving the undercoat short and fine. Varieties, if not distinct species, occur in Siberia, on the high mountains of Caucasus, and of Nubia.

Leaving the goats, we next notice the *Sheep*, distinguished by the general want of a beard, a convex line

of profile, and by the *tournure* of the horns, which, at first sweeping backwards, gradually return so as to point forwards, with a tendency to a spiral curve. The name of the genus, or rather as we esteem it section of one great natural family, is *Ovis*, LIN.

To enumerate all the races or breeds of this animal in a state of domestication would be a profitless undertaking. In every age the Sheep has been among the most valued of man's possessions, and its history is blended with that of the laws and customs of nations. Writers, sacred and profane, poets and historians of all times, have abounded in allusions to it; and what can be more beautiful or more interesting than to behold hill and valley whitened with flocks, feeding in peaceful security; such a scene may well remind us of the days of the Patriarchs, when the office of a shepherd was the occupation of chiefs and princes, and a pastoral life the sole condition of mankind. Rachel, we are told, kept her father's sheep, Gen. xxix. 9; Joseph and his brethren were feeders of sheep; and Moses "kept the flock of Jethro, his father-in-law, the priest of Midian; and he led the flock to the backside of the desert, and came to the mountain of God, even to Horeb," Exod. iii. 1. The firstlings of the flock were offered in sacrifice according to the Jewish ritual: "Now this is that which thou shalt offer upon the altar; two lambs of the first year day by day continually. The one lamb thou shalt offer in the morning, and the other lamb thou shalt offer at even," Exod. xxix. 38, 39. Hence, as the Antitype of these sacrifices, Christ is expressly

called "the Lamb of God, that taketh away the sins of the world;" "a Lamb without blemish and spot." In the 5th of Revelation the same figure is carried on, see verse 6; And lo, in the midst of the throne, ... "*stood a Lamb as it had been slain.*" And again: "After this I beheld, and, lo, a great multitude, which no man could number, of all nations and kindreds, and people and tongues, stood before the throne, and before the Lamb, clothed with white robes, and palms in their hands; and cried with a loud voice, saying, Salvation to our God which sitteth upon the throne, and unto the Lamb," ch. vii. 9, 10. The people of God are also often described under the similitude of sheep, Chiist being the Shepherd: "I am the good Shepherd, and know my *sheep*, and am known of mine, ...'and I lay down my life for the sheep," John x. 14, 15.

We need not, however, dilate upon this part of our subject; every reader is doubtless familiar with those interesting passages, passages of vital import, in which the sheep is alluded to; nor indeed will our limits allow us more than just to drop a few hints by way of improvement. Though we "like *sheep* have gone astray," yet if by grace through faith we have returned to the "great Shepherd and Bishop of souls," if we can say, "we are the sheep of thy pasture:" happy shall we be at that hour when he divideth the *sheep* from the *goats*, and "shall set the *sheep* on his right hand," saying, "Come, ye blessed of my Father, inherit the kingdom prepared for you from the foundation of the world."

To return. In a state of complete subserviency to man, the Sheep offers in every country peculiar modifications of character, produced no doubt by a combination of circumstances. Among our European breeds none are more celebrated than the Merino sheep of Spain; which have been transferred to our country, to Germany, and New South Wales. In hotter countries the fleece gives way to hair, and loses its form as wool. In Russia there is a breed distinguished by a long trailing tail; and in India and Guinea, a race which, to an elongated tail, add long pendent ears, a marked convexity of forehead, and long and slender limbs; they are without horns, and have hair short and smooth. In Persia, Tartary, and China, we find the Sheep with a tail transformed into an enormous double globe of fat. In Syria and Barbary the Sheep have the tail of considerable length, and consisting of one immense mass of fat, so that it is often necessary to support it artificially.

Many wild races of sheep are found to inhabit the mountain regions of Eastern Europe, of Asia, of Africa, and America. Of these we may mention the ARGALI of Siberia, *(Ovis ammon,* LIN.) a native of the mountains of Asia, strong, muscular, and active. Its size is that of a deer; the horns are thick and roughly ringed; in summer the hair is smooth, and yellowish gray; in winter it becomes thick, harsh, and reddish; the muzzle, the throat, and under parts remaining always whitish.

A curious modification occasioned by cultivation is

the possession of *four* horns, a *lusus* frequent among the races of Asia, and the peculiarity of a breed common in the north of Europe, said to have been originally derived from Iceland and the Feroe Islands. Of the head of one of this remarkable variety, the following is a characteristic sketch.



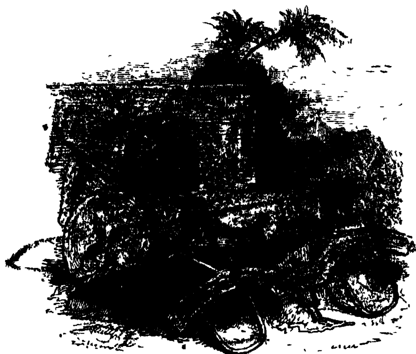
Allied to the *argali* is the MOUFLON of Sardinia, *(Ovis musimon,* PALL.) differing from it only in being

somewhat less in size, and in the horns being either very small or altogether absent in the female; it is found among the mountains of Crete, Sardinia, and Corsica.

We must now pass from the sheep to the last genus of the order Ruminantia, a genus equally interesting to man, and equally connected with his history. It is the genus *Bos*, embracing the various races of oxen distributed over the face of the globe. Their distinguishing characters as a genus consist in the horns being smooth except at the base, where they are ringed, simple, curved outwards at the base and upwards at the point, the osseous core within having cavities communicating with the frontal sinuses, in the muzzle being large, the skin of the neck forming a pendulous dewlap, and in general robustness and the massive construction of the body. Reclaimed as the ox has been from the earliest ages, we are here also involved in a labyrinth of difficulties when we attempt to search out the origin of our domesticated varieties, presenting an endless diversity of form, size, and colour; nor, indeed, were we to devote our labour to the utmost in the endeavour, is it probable that we should arrive at any thing like a satisfactory conclusion. Our aim will be, therefore, to take a glance at the various domestic races as they now present themselves, and then to notice a few of those species which are truly distinct, and which roam the plains and the morasses at large, unsubdued by man.

To dwell upon the utility of this tribe of animals would be superfluous; we have but to consider the be-

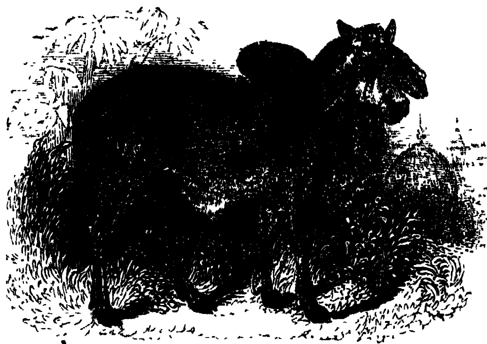
nefits derived from it, its importance in a national point of view, and the allusions to it in the holy scriptures, to be convinced that it is one upon which the human race is more immediately dependent than upon any other which the Almighty in his wisdom has created. Herds of cattle, of sheep, and of goats were the wealth of ancient days; and, indeed, are they not so now? for what are gold and silver but the representatives of these and of other things without which man would drag on a miserable existence.



The races of cattle as we find them in Europe are all pretty nearly alike, differing only in such particulars as are produced by different modes of feeding, and which are too trivial for us to notice. When, however, we pass into India we are struck with the contrast of characters which the various breeds there present, characters which, but that we know what domestication can effect, would almost lead us to

imagine we were contemplating a distinct species. Instead of the straight back, the square-turned head, the small ears, the fiery eye, and the short muscular limbs of our cattle, the INDIAN OX, or Brahmin Bull, as it is commonly called, *(Bos Taurus,* var. *Indicus,)* is distinguished by a more elongated form of skull, with a decidedly concave line of profile, an arched neck, a hump of fatty substance rising from the withers, an arched back sinking and rounded off on the crupper, an enormous dewlap hanging down in folds, long pendulous ears, a mild and sleepy eye, and limbs long and taper. This race, of which numerous breeds occur, " varying in size from that of a *large mastiff dog* to that of a *full grown buffalo,* are spread more or less extensively," says the author of the Gardens delineated, " over the whole of Southern Asia, the islands of the Indian Archipelago, and the eastern coast of Africa from Abyssinia to the Cape of Good Hope. In all these countries the Zebu, (for so is the humped variety termed,) supplies the place of the ox both as a beast of burden, and as an article of food and domestic economy. In some parts of India it executes the duties of a horse also, being either saddled and ridden, or harnessed in a carriage, and performing in this manner journeys of considerable length with tolerable celerity. Some of the older writers speak of fifty or sixty miles a day as its usual rate of travelling; but the more moderate computation of recent authors does not exceed from twenty to thirty. Its beef is considered by no means despicable, though far from equalling that of the European ox. The hump, which is chiefly composed of fat, is reckoned the most deli-

cate part. As might naturally be expected from its perfect domestication and wide diffusion, the Zebu is subject to as great a variety of colours as those which



affect the European race. Its most common hue is light ashy gray, passing into cream colour or milk white; but it is not unfrequently marked with various shades of red or brown, and occasionally it becomes perfectly black. The hump is sometimes elevated in a remarkable degree, and usually retains its upright position, but sometimes it becomes half pendulous, and hangs partly over towards one side. Instances are cited in which it had attained the enormous weight of fifty pounds. A distinct breed is spoken of as common in Surat, which is furnished with a second hump." Page 67.

In the Gardens of the Zoological Society, London, the curious may be gratified with the sight of specimens of two well contrasted breeds of the Zebu or

Humped Ox; the one scarcely exceeding a sheep in size, docile, intelligent, active, and of beautiful symmetry; the other, of which we have given a faithful portrait, exceeding our ox in height, and equally remarkable for his noble presence as for his quiet and submissive temper.

The Hindoos, it is well known, treat the whole of the breeds of oxen with superstitious veneration, holding it sinful to deprive them of life, and regarding the feeding upon their flesh with the greatest abhorrence. To the larger breed in particular they pay the utmost reverence; and in many towns and villages numbers of these privileged animals wander at ease about the streets, supplied by the hands of superstitious devotees Emboldened by the toleration they experience, they make free with every vegetable to which they take a fancy, no one daring to resist or drive them away; often they lie down in the street; no one must disturb them; every one must give place to the sacred Ox of Brahma: thus they frequently prove nuisances which superstition alone would endure. We might be inclined to smile at all this, did we not see in it proofs of a moral and intellectual debasement, exciting us at the same time to pity and condemn. Idolatry and superstition seem to have made their strong hold in the east from the remotest times, fencing themselves around with a panoply of rites and observances as absurd as cruel. Heavy is the galling yoke of idolatry, painful and degrading are all its observances; but oh, how different are the precepts of that pure and holy faith proclaimed by the blessed Redeemer, whose "yoke is easy, and whose burden is light;" these

purify and exalt, and give a dignity to our nature which it never had before; and while they bid the "weary and heavy laden" approach and find relief, they teach them to place their affections on things above, and not on things below.

The domestic breed of European cattle has been carried into various regions where it was previously unknown, and in some it has emancipated itself from the dominion of man, and increased in great abundance. In South America, for example, where the ox was first introduced by the Spaniards, herds wander at pleasure over the rich savannahs and plains teeming with a luxuriant vegetation, fleet and wild; the Mexican hunts them on horseback, and, singling out an individual, throws his *lasso* over the horns or around the limbs with unerring precision; the end of this lasso or noose of leather is fastened to the girths of the horse, which is trained to resist the sudden strain of the wild and furious bull rushing in his headlong course. One lasso is scarcely fixed before another rider, galloping by, throws his also; another, and perhaps another succeed: the plunging struggling beast thus securely enveloped is dragged along to the slaughter, or slain on the spot.

The scripture allusions to the Ox are too numerous for us to recapitulate, and will not fail to suggest themselves to the reader's recollection. From various hints we learn how nearly the same as in the present day were the uses for which it was anciently employed in the east: it applied its neck to the yoke, it dragged the plough, and trod out the grain upon the threshing-floor; and laws were instituted by the command of

God to regulate its treatment and its reward: "Thou shalt not muzzle the ox when he treadeth out the corn," Deut. xxv. 4.

There is in Europe an animal of this genus which has never been reclaimed, and which was once spread over the greatest portion of that continent; but which, since the advance of cultivation, has become bounded in the limits of its habitat. The animal we allude to is the AUROCHS or ZUBR, *(Bos urus.)* Some naturalists have supposed the Aurochs to be the wild origin of our domestic race. This opinion, however, is without foundation; it is truly a distinct species; and this distinction rests not on external characters only, but on a singular anatomical difference, which at once decides the question. In all domestic cattle, however the breeds may vary in size or other distinctions of a similar nature, their internal anatomy remains unmodified: we find the number of ribs on each side to be uniformly thirteen; but in the Aurochs we find the number increased to fourteen; and in an allied species in North America, we shall find a still additional rib, making fifteen. The Aurochs is the largest of European mammalia; it is characterised by the breadth and the convexity of its forehead, by the attachment of its horns below the occipital ridge, and by the elevation of its limbs. A sort of crisped wool intermingled with shaggy coarse hair covers the shoulders, head, and neck of the male, and forms a full beard beneath the throat; its voice is hoarse and grunting; its colour is dirty grayish brown.

The Aurochs is a savage and ferocious animal,

thinly scattered through the marshes of Lithuania. Little is known of its habits; it lives secluded in the deepest recesses, where a rank and luxuriant vegetation supplies it with food. When Europe was a mighty forest, when the lands now enclosed and teeming with harvests were morasses and swamps, this creature was the chase of the savage hunter throughout all the central regions; but, like all savage beasts, its numbers have dwindled, and its range has become restricted by the introduction of arts and letters.

Southern Africa produces the CAPE BUFFALO, *(Bos Caffer,)* an animal of enormous size and of great ferocity, inhabiting the woods and jungles by marshes and rivers, where it wallows in the mud like the rhinoceros, remaining concealed during the heats of the day. The aspect of the Buffalo is cunning and savage; the eyes being deeply sunk and overshadowed by the horns, which arise each from a flattened base of enormous thickness, rough with irregular ridges, in contact at the roots, and covering the whole upper part of the skull with an impenetrable mass of horn; from this solid portion the horn as it proceeds sweeps downwards in a lateral direction, and then turns upwards, ending in a conical point. The weight of these formidable instruments is very great, requiring amazing power in the neck and shoulders. The ears hang down; the limbs are short and bony; the body muscular; the hair is dark brown, harsh, thin, and straggling. The hide is of great thickness, and forms a hard impenetrable leather; the flesh is coarse, but, it is said, not unpleasant.

India produces many wild species; of these the *Arni* is confined to the central regions. It is distinguished by the size and figure of its horns, which rise upwards with a sweep outwards, and gradually incline together at the points so as to give a figure somewhat lyre-shaped; their length is often five feet.

The ARNI, *(Bos arni,)* is supposed by some to be a variety of the Common Buffalo, *(Bos bubalus,)* an animal which is spread from India through the adjacent countries, and was formerly, as in the present day, used as a beast of burden in Egypt, Greece, and Italy. In the latter country herds of the common buffalo exist wild in the morasses and woods of the Maremma, a region extending from the sea-shore to the lower ridges of the Apennines.

Besides the Arni, India produces the GOUR, *(Bos Gour,)* which lives in small herds in the forests of the interior. Its horns are short, but thick and ponderous, and bending downwards at the point; its colour is deep bluish black; the tail is thick and bushy. It was first discovered in the mountains of *Myn-pat;* and it is said to be fierce and bold.

The GYHAL, *(Bos frontalis,)* is another of the Indian races, and is chiefly found in the eastetn districts of Bengal. In its general characters it much resembles the common domestic breed; but the horns are flattened from before backwards, and proceed without any angle or twist, in a lateral direction, more or less upwards. The hair is short and black, except on the

forehead and along the spine, where it is gray or yellowish; the limbs being white. In the mountainous districts of the north-east of India, the Gyhal is domesticated and used for burdens.

In Eastern Tartary we find a singular species, the YACK, (*Bos grunniens*, LIN.) frequenting the woods and recesses among the mountains of Thibet. The Yack is not unlike the buffalo in its general form, but of smaller size; it is distinguished by the tail being furnished with full flowing hair, like that of a horse, and by a sort of mane along the neck and back; the hair of the body is smooth, and short in summer; but it becomes thick and harsh in winter; its colour is black. This animal is savage and dangerous; it is, however, domesticated by the Mongols; and its tail forms the standards of battle, and regulates the distinctions of rank and titles; hence the Pachas are classed as those of one, two, or three tails. It was known to the ancients, and is mentioned by Ælian.

Having thus glanced at the principal species of this genus which the older continents afford, it remains for us to notice those which are exclusively natives of America, and which in the plains and forests there represent the wild breeds of Europe or Asia. These races we have seen to be pretty numerous and extensively diffused, each country having its peculiar species. America possessès two species, and both are peculiar to the higher latitudes of the northern portion. Of these the first we shall notice is the BISON, (*Bos*

Americanus, GMEL.) The Bison associates in vast herds, which roam over the uninhabited plains of the countries bordering the Missouri, the great Slave Lake, and other districts where European civilization has not hitherto advanced.

At no distant date the Bison was found abundantly in the western parts of Pennsylvania and in Kentucky; but the species has gradually retired before the influx of white population, and the southern and eastern limits of its range are bounded by the Ohio and the Mississippi. Formerly the migrations of this animal westward were limited by the Rocky Mountain range; but they have of late opened for themselves a passage "across the mountains near the sources of the Saskatchewan, and their numbers to the westward are annually increasing." The Bison delights in level prairies, covered with luxuriant vegetation, bordering the hills of limestone formation, where saline springs or marshes abundantly occur. Wherever there are salt-licks, as these saline springs are called, there herds of this animal are sure to congregate, and remain throughout the year, scraping away the snow in winter to obtain the herbage beneath. In other parts, however, they migrate, with the seasons, in search of pasturage. The Bison is a shy and wary animal; usually it flies before its pursuers; but it sometimes happens that, led by an infuriated individual, the whole herd will turn and rush towards the hunters, trampling them down in their headlong course. Nor is it safe for the hunter to show himself after having wounded a Bison, for, though the creature be heavy, it will easily overtake the fleetest runner. Dr. Richardson, (Vide *Fauna*

Boreali-Americana,) in speaking of the danger of attacking the Bison, says, "Mr. Finnan M'Donald, one of the Hudson's Bay Company's clerks, was descending the Saskatchewan in a boat, and one evening, having pitched his tent for the night, he went out in the dusk to look for game. It had become nearly dark when he fired at a Bison Bull, which was galloping over a small eminence, and as he was hastening forward to see if his shot had taken effect, the wounded beast made a rush at him. He had the presence of mind to seize the animal by the long hair on its forehead as it struck him on the side with its horn, and being a remarkably tall and powerful man, a struggle ensued, which continued till his wrist was severely sprained, and his arm was rendered powerless: he then fell, and, after receiving two or three blows, became senseless. Shortly afterwards he was found by his companions lying bathed in blood, being gored in several places, and the Bison was couched beside him apparently waiting to renew the attack had he shown any signs of life. Mr. M'Donald recovered from the immediate effects of the injuries he received, but died a few months afterwards. Many other instances might be mentioned of the tenaciousness with which this animal pursues its revenge; and we have been told of a hunter having been detained for many hours in a tree by an old bull which had taken its post below to watch him." In contending with a dog the Bison strikes violently with his fore hoofs. Its mode of running is singular, leaning as it gallops along for a short space of time first to one side and then to the other alternately. Its flesh is excellent; the tongue,

and the haunch covering the spinous processes of the first vertebræ of the back are reckoned especial delicacies. Its hide is valuable, and, when dressed with the fine woolly hair on, forms an excellent blanket or travelling wrapper, and sells in Canada for three or four pounds.

The aspect of the Bison is fierce, wild, and malicious, the eyes being small, fiery, and half hid in the profusion of long shaggy hair, intermingled with wool, which envelopes the head, neck, and shoulders. The head is large and ponderous, with a convex line of profile; the withers are high, owing to the elongation of the spinous processes there for the attachment of the ligament, and of the enormous muscles of the neck, serving for the support of the head; besides which there is added a fatty deposition or sort of hunch. From the withers the back gradually declines, the hind quarters appearing disproportionably weak and small. All this part of the body is clothed with shorter wool. The limbs are rather short, and possess amazing power; the tail is tufted with coarse straight hair; the horns are short, tapering, and erect; the general colour is dark umbre brown, becoming tinged with a grayish hue in winter.

The height of the Bison at the shoulders is upwards of six feet; its weight is twelve or fourteen hundred pounds. The female is smaller.

Of the distinction of species between the Bison and all others of its genus there can be no doubt. We stated, it will be remembered, that in the domestic ox and its numerous varieties the number of ribs on each side was always thirteen; that in the Aurochs of Poland

the number was increased to fourteen; in the present animal we find an additional increase, the number being fifteen. Anatomical tests are of all others the surest: Nature cannot err; and in following her characters the naturalist will never find himself bewildered in the mazes of conjecture; but in a genus like the present, where outward forms seem peculiarly liable to change according to the combined operation of united causes, such anatomical minutiæ are of tenfold importance.

Our next and last example is the MUSK OX, or Oomingmak of the Esquimaux, (*Bos moschatus*, GMEL.) The Musk Ox has been placed by Blainville in a genus separate from that of *Bos*, in consequence of the want of a naked muzzle, as is possessed by the rest of the race; hehce being, according to his views, an intermediate link between the ox and the sheep. The genus thus characterized is termed by him *Ovibos;* but we have retained the old generic name, because we are unwilling to separate a single species upon so slight a foundation. This singular animal is confined to the arctic regions of America, inhabiting the *barren lands* lying to the northwards of the 60th parallel of latitude, but sometimes appearing a few degrees lower; westwards it occurs as low as 57°.

Dr. Richardson says, that the "districts inhabited by the Musk Ox are the proper lands of the Esquimaux; and neither the northern Indians nor the Crees have an original name for it, both terming it *bison* with an additional epithet. The country frequented by the Musk Ox is mostly rocky and destitute of wood,

except on the banks of the larger rivers, which are generally more or less thickly clothed with spruce-trees. Their food is similar to that of the caribou, (reindeer,) grass at one season, lichens at another."

The Musk Ox is generally found in small herds of twenty or thirty head, which are harassed by the hunters as often as they approach the habitations of man; yet the chase is not without danger, as the males are apt, when irritated and wounded, to turn with vindictive fury upon the hunter. The flesh of the animal when fat is tolerably good; but when lean, as it is at certain seasons, is not only coarse, but is both scented and flavoured strongly with musk, whence the animal's distinguishing title. The senses of sight, smell, and hearing, are very acute; and it is difficult for the hunter to approach a herd without discovery.

In size the Musk Ox is small, the carcass, exclusive of the offal, weighing about three hundred weight; the limbs are short and stout; the hoofs being somewhat narrower, but not longer, than those of the caribou, so that it requires an experienced hunter to know the difference of the impressions they leave in the soil or the snow. It runs with great swiftness, and climbs rocky paths and the abrupt sides of the hills with great agility. "One, pursued on the banks of the Coppermine, scaled a lofty sand cliff having so great a declivity that we were obliged to crawl on hands and knees to follow it." Like the bison, the Musk Ox is clothed with long shaggy hair, curled and matted on the neck and shoulders, but lying more smoothly on the hips and hinder quarters, though still of extraordinary length, and very fine. The general colour

is brown, except a saddle-like mark in the centre of the back, of a dirty gray. Beneath the hair there is a large quantity of brown or ash-coloured wool, forming an admirable under-coat; the tail is short and concealed among the hair. The head is large and square, with a convex forehead; the horns are very thick and broad at their origin, where they rise in contact with each other from a flattened base; as they proceed they become rounder and tapering, sweeping downwards between the eyes and ears till they reach the angle of the mouth, when they abruptly turn upwards, ending in a sharp point about the level of the eyes. The nostrils are oblong slits in close approximation at their lowest points, and gradually diverging outwards. The eyes are moderately large; the ears short, and not very conspicuous. There is a beautiful specimen of this singular and interesting animal in the British Museum.

We have thus concluded the present genus, and with it the great *order Ruminantia;* an order characterized by features too simple and true to be ever mistaken. We have found the different genera composing it to be such as include the useful, the graceful, and the interesting: the camel, the reindeer, the antelope, and the cattle of our farms. We have often, in our examination of it, had occasion to admire the wisdom and the goodness of God; and in looking back upon it, as we take our leave, may we not say, "How excellent are thy works! in wisdom thou hast made them all."

ORDER IX.—CETACEA.

Body constructed for inhabiting the water; limbs consisting of an anterior pair only, forming paddles or oars; teeth variable—in some cases there are only horny laminæ instead.

We have hitherto been contemplating races of mammalia furnished with four extremities, adapting them to traverse the earth, to roam the woods, the vales, and the mountains, which diversify the solid surface of our planet. Some few, it is true, as the seal and walrus, have had the limbs formed expressly for swimming, and for habits more or less aquatic; but even here, it will be remembered that the limbs were four, and that the water was by no means their constant abode; they came on shore to bask in the sun, climbed rocks or masses of ice, upon which they would repose for days, or sport and gambol; and that they entered deep caves or fissures of the cliffs along the coast for the purpose of bringing forth and rearing their young, swimming out to sea only for the sake of food. We have also seen that in every order the head was separated from the body by a distinct neck, and the skin more or less covered with hair, or fur. But we are now about to contemplate a race of mammalia possessing very different characters, a race adapted exclusively for the ocean, where they roll and plunge and sport among the waves, or seek the deep sea-caves, or wander among coral groves of stately and luxuriant growth. If we look at these monsters of the deep, we

find the whole of their organization modified so as to fit them for their "ocean-home." The first modification of parts is in the limbs. We have traced the changes of the hand from man to the *solidungulous* animal; we have marked the opposable thumb, so perfect in the human hand, beginning to shorten in the *quadrumana;* in some of which indeed it dwindled to a mere rudiment; after this we saw it lose its character as a thumb altogether, remaining as a claw in the *carnivora* and the *rodentia,* in some of the orders of which it was lost. In the sloth, and also in the other *edentata,* we found a diminution in the number of the fingers; these fingers, which remained, having lost their flexibility. In the *pachydermata* and in the *ruminating* animals we could no longer recognise fingers at all, and the limbs were accordingly modified, losing the last faint relics of the power of rotation, and becoming simple props or pillars for the body. In all these changes, in every grade of difference, we saw a reference to habits and modes of life: the hands of the monkey, the hooks of the sloth, the talons of the lion, the hoofs of the antelope, are all demonstrations of design. And so it is in the order we are about to contemplate: the order *Cetacea,* including the whales, the porpoises, the narwhals, giants of the brute creation, that flounder in the deep.

Here we find the posterior extremities lost, and the anterior limbs degenerated into the form of fins or paddles, without distinct fingers, and only adapted to propel the body through the water. If we dissect for the bones of these paddles, we find them short and flattened, yet distinct and hand-like; but the whole of

this osseous framework is enveloped in a cartilaginous covering, so as to form an undivided oar. The contour of the body is fishlike, no neck being distinguishable, and the whole tapering down gradually from the head to the tail; the tail, however, (a cartilaginous structure,) though like that of a fish in figure, is placed not vertically but horizontally, and moved upwards and downwards by muscles of enormous force and volume. This position of the tail is indispensable to the animals of this order, as it enables them by means of a few powerful strokes to rise or dive with the utmost rapidity: and be it remembered that these are animals that *breathe the air with true lungs;* that *suckle their young, and rear them with tender solicitude;* animals with *a double heart,* and whose *blood is red and warm;* animals, in short, that differ in nothing, as it respects *organic conformation,* from the rest of the mammalia, except in the nature of their appointed habitation: hence, deep as the whale may plunge, in a few minutes he must rise, and rise rapidly, to breathe.

The skin is naked, and between it and the muscles there is a layer of adipose substance or blubber, varying in its depth in different species: in the whale it is ten or twelve feet. The use of this blubber is twofold: by its elasticity it defends the internal organs against the pressure of the surrounding water at immense depths; but its principal use is to preserve the vital heat of the body in a cold medium, which has a perpetual tendency to abstract caloric. Were it not for this layer of blubber, one of the worst conductors

of heat, the Whale would perish from cold, his gigantic carcass would stiffen in the polar sea, for his vital energies unaided would be unable to resist the effects of so low a degree of temperature. Land mammalia of the north have thick furry vestments to protect the body; but fur, long and thick, would not do for the Whale; it would be useless, it would become saturated. God, therefore, has given him an equivalent in an envelope of blubber around him. We may also add, as another of its uses, that it increases the specific lightness of the body, rendering it more buoyant in the water.

The eyes of the *Cetacea* are expressly formed for the dense medium the animals inhabit. "No object," says Dr. Fleming, "is visible to the eye unless the angle formed by its extreme points exceeds thirty-four seconds of a degree. In order to render the impression distinct it is necessary that all the *rays which proceed from any one point of a body* should be *collected* in one point of the *retina*, and that all the points of union thus formed should be disposed in that organ in the same relative position as in the body from whence they emanated. For the accomplishment of this purpose the *humours* of the eye are so adjusted in their form, density, and refractive power, as to *prevent* any *dispersion* or decomposition of the rays. Thus they act in a similar manner to the compound object-glasses of an achromatic telescope.

"As animals reside in different media, it is obvious that the eyes of each must possess different refractive powers. In the land animals the *cornea* is usually

convex, and the aqueous humour abundant; while in aquatic animals the former is flat, and the latter in small quantity. In land animals the *aqueous humour* possesses *great power* of *refracting* rays, passing to it through *air*, aided likewise by the convexity of its surface; but its refractive power in *water* would be comparatively *weak*. This defect, however, is supplied by the *spherical form* and *great refractive power* of the *lens*, as may be seen in *whales, diving birds*, and *fishes*."

In the *Cetacea* we find no external ears; there are, however, small orifices, which transmit sound to the internal organ.

The present order is divided into two families, or sections: 1st, the *herbivorous cetacea*, which feed on submarine plants; 2d, the *true cetacea* of Cuvier, the *piscivorous cetacea* of other authors, feeding upon fishes, moluscous animals, zoophytes, and the like.

1st. The Herbivorous Cetacea.

In this section we find teeth with a flattened surface, in accordance with the nature of the food; the head is rounded, there are strong moustaches on the lips, and the mammæ are pectoral; circumstances which, when the body is raised up in the water, produce something like a resemblance to the human figure, and have given rise to the fabulous narratives of travellers respecting "*the mermaid*."

As in most true herbivorous animals, the stomach is complicated, being divided into four cavities. The nostrils open at the muzzle.

Our first genus is *Manatus*, or that of the *Lamantine*. The body is oblong, the tail, or rather caudal paddle,

oval and elongated; the grinders are eight on each side above and below: incisors and canine teeth are wanting. We find rudiments of nails on the edges of the anterior paddles or flippers, which are perhaps of use in enabling the animals to drag their body along among weeds and marine vegetables, as well as to carry their young.

Of the Lamantine three or four different species are recognised. They are natives respectively of the seas which wash the shores of South America, and those of Western Africa, habitually frequenting the wide mouths of the larger rivers at their entrance into the ocean.

The next genus we shall notice is one closely allied to the preceding, (namely, *Halicore*, Ill.) and including but one species, the Dugong of the Indian Seas, (*Halicore Dugong.*) The grinders are three on each side above and below, each being composed of two cones united together at the sides; there are two incisors above, just appearing through the gum, but possessing roots of enormous length, enclosed in a hollow cavity in each of the intermaxillary bones; these bones are brought forward in a singular manner, so as to throw the mouth below; the body is round and tapering; the tail crescent-shaped. The Dugong is a native of the seas of India, of the adjacent islands, and of the northern line of Australia. In clear still water it may be seen browsing on the fuci and submarine vegetables at a great depth; for this mode of feeding its mouth is expressly placed: there is no neck which it can bend down like the ox or the horse. If therefore

its mouth were situated as it is in such animals, the Dugong could not apply it to the green turf of the meadows beneath the waste of waters, without elevating the hinder parts of the body perpendicularly, a position in every respect unsuitable; the mouth is therefore placed beneath the head, so that in the natural position of the body the animal may browse at ease. The flesh of the Dugong is much esteemed as food, being delicate and tender, and not unlike beef. The length of this animal is from six to seven feet. There is a fine specimen in the Museum of the Zoological Society, London, from the coast of Sumatra.

We shall now pass to the *true Cetacea*, a section containing several genera, and exhibiting the following common characters. Their food is animal matter, such as fishes and molusca; the skin is smooth, and on the back there is in many species a vertical cartilaginous fin, unconnected with the skeleton. The nostrils, or *blowholes*, are situated on the top of the head, which is the most elevated part of the body, so as to be always above the surface of the water when the animals are floating. These nostrils are small openings into a tubular elongation or sack of the *nares*, provided with a muscular apparatus for the purpose of compressing it with vehemence; hence it is that the small apertures of this sack are called *blowholes*, because when the animals come to the surface to respire they produce by the forcible expulsion of the air a hissing noise, heard in the Whale at a great distance; and a column of vapour arises often to a considerable height. It also sometimes happens that long before reaching the

surface the animal breathes out the air pent up in the lungs with considerable violence, throwing up the spray in arched *jets d'eau;* and this is most usually the case if the animal has been chased, or is alarmed; for then, though forced to come to the surface to breathe, it has not time to breathe leisurely, and begins, while yet beneath the water, to empty the lungs for a fresh inspiration. Cuvier says, that in swallowing their prey they engulf large volumes of water, which, in order to get rid of, they violently force through the nostrils by the compression of powerful muscles. This, however, is not the opinion of Captain Scoresby, whose opportunities of correct information have enabled him to rectify many errors, and add much information to our knowledge of this race.

The larynx, or windpipe, opens into the back of the nostrils in the form of a pyramid. The glottis is simple, so that the voice whenever exerted consists in a bellowing sound only. The sight is quick beneath the water; as is the hearing also. It has been doubted if the sense of smell existed in any degree of perfection: it would appear, however, that these animals are sensible of the noxious smell of bilge-water, pumped from the hold of vessels, as has been tried in one or two recorded instances. The stomach is complicated, having many subdivisions. The cervical vertebræ are thin, often more or less anchylosed together, and sometimes only five in number. The head is large, in many exceeding the rest of the body.

Of the many genera embraced by this section we first select that of the Dolphins, (*Delphinus*, Linn.)

The land has its tyrants, cruel and voracious, and, though not the largest, the most formidable of terrestrial mammalia. The sea also has its tyrants among the mammalia, which roam its depths; fierce and sanguinary, they are the *carnassiers* of the waters, preying upon the finny tribes, which they chase in all directions; and their teeth are modified accordingly. Such are the Dolphins and the Porpoises.

The genus Delphinus is characterized by teeth, simple, conical, and numerous; the forehead is rounded, and the muzzle projects from the head so as to form a sort of beak, or slender snout, well armed with weapons.

Of this genus our example is the celebrated DOLPHIN, (*Delphinus Delphis*, LINN.) which figures in so many fables, and has gained more credit from poetry than it deserves; not that it is devoid of intelligence, but its habits are wolfish. In collected troops it hunts down its prey, cleaving the waters with astonishing velocity, and driving the flying fishes from their element to take temporary refuge in the air, but still keeping up the chase till the exhausted victims are secured. The Dolphin is met with in all the warmer seas; its length is from eight to ten feet. Its manners were well known to the ancients, and it is accurately figured on many of their coins. Its habits of gamboling and sporting in the deep are described by Ovid with admirable fidelity:—

" Undique dant saltus, multâque adspergine rorant
Emerguntque iterùm, redeuntque sub æquora rursùs;

Inque chori ludunt speciem, lascivaque jactant
Corpora, et acceptum patulis mare naribus efflant."

On every side above the waves they spring,
And showers of spray in gamesome frolic fling;
Again they rise in light, again they sweep
Beneath the briny waters of the deep,
And joining bands, as if in mimic play,
The winding measures of the dance essay,
And toss their sportive forms, and snort and blow,
And streams of brine through widen'd nostrils throw.

The PORPOISES, *(Phocæna,* CUVIER,) differ from the dolphins only in having a shorter muzzle equally elevated with the forehead.

The COMMON PORPOISE, *(Phocæna communis,)* is a native of our coasts, as well as of those of continental Europe; it is the smallest of the *Cetacea,* seldom attaining more than four or five feet in length. It abounds in the mouths of rivers in shoals, where it may be seen to rise every few moments to the surface, and plunge down again instantaneously with a rolling motion, occasioned by the up-and-down strokes of the tail.

We find the Porpoise among the luxuries of the table even so late as the last century; but its flesh is oily and disagreeable. When shoals of herrings or mackarel visit our shores, the Porpoise revels in a perpetual feast, and may be seen pursuing its prey with great assiduity. It has been often known to travel far up the course of our rivers.

Our next genus is *Monodon,* which contains the

Narwal, a native of the polar seas. In this animal we find no true teeth, but two tusks, analogous to those of the elephant, implanted in the intermaxillary bones. Of these tusks the left is enormously developed, projecting straight forwards with the line of the body, being spirally twisted, and tapering to a point. Its length is from six to eight or ten feet; the tusk on the right side is imperfectly developed, seldom advancing far out of the socket, and sometimes not appearing beyond it. Should its fellow, however, be broken off, it then begins to increase, though it never equals the lost one. According to general account, the Narwal is about double or triple the length of its tusk; the skin is marbled with brown and white; the mouth is small. The velocity of this animal, and the impetus with which it cleaves the waters, may be conceived from the fact of its having been known in more instances than one to plunge its tusk through the sides of a vessel, in the timbers of which the portion driven in has been snapped off by the violence of the blow.

The Narwal is said to attack the huge whale, into whose sides he drives his formidable weapon, and greedily takes in the oily blubber which oozes from each wound inflicted. It is also said to live upon dead animal matter in general; *nar* signifying in Icelandish, carrion; *wal*, or *wale*, being synonymous with our word *whale*, and derived from the same Teutonic root.

We now arrive at a group of the *Cetacea* having the head so enormously large as to constitute a third, or

even half of the total length of the body. This increased magnitude of the head has however nothing to do with the developement of the brain, but is simply produced by the extension of the bones of the face. This group comprehends those gigantic monsters of the deep, the hugest of all living beings, expressly known by the name of Whales.

We shall first notice the genus *Physeter;* it includes the Cachalots, or Spermaceti Whales, creatures of enormous bulk and tiger-like voracity, pursuing their prey, consisting of seals and large fishes, with "a bitterness and pertinacity that has scarcely any parallel in animated nature." The head is of prodigious volume; the upper jaw is destitute of teeth and also of the plates called whalebone, (which, as we shall see, are a marked character in other genera;) but the lower jaw, which is straight, and elongated, and of enormous weight and solidity, fits into a groove in the upper, and is armed with a range of short cylindrical or conical teeth on each side, received into corresponding cavities in the upper jaw, of which the gum is as hard and callous as cartilage. The superior portion of the skull consists of a series of large cavities, filled with a clear transparent oleaginous fluid, which hardens on cooling. In this concrete state it is known under the name of spermaceti, but more properly *adipocire.* From the skull a chain of membranous sacks extends through various parts of the body, filled with a similar fluid; they even ramify among the ordinary blubber beneath the skin.

The CACHALOT, (*Physeter macrocephalus*, LACEP.) appears to be by no means so limited in its habitat as many of the giant race to which it belongs. It has been known to occur, according to Cuvier, in the Adriatic; and we have many instances on record of its having been captured on our British coasts. In 1769 a Cachalot was seen off the Kentish coast; in 1774 a very large one was stranded on the coast of Norfolk. In March, 1784, thirty-two young ones were cast ashore during a storm near Audierne, in France; and some few years since a small one was captured in the Thames near Gravesend. The most remarkable instance, however, of the capture of this animal on our shores took place during the month of Feb. 1819, in Whitstable Bay. It appears that the Whale was observed in shallow water (on the 11th) off the Essex coast. "He was immediately attacked by two boats, the men in which, trying to kill or disable him, commenced by destroying his sight." They then stabbed him, and deeming him exhausted with the immense loss of blood, and his violent and agonized efforts, "attempted to secure him by two very strong cables, and with another fastened a small anchor to his tail. The cables were speedily snapped, and the leviathan broke from his pursuers, but only to meet a more certain fate on the opposite shore. The Whitstable men were more fortunate, the Whale becoming stranded upon their coast, and assisting to destroy himself by his tremendous efforts to escape into his native element from the incessant persecutions of his new enemies, who endeavoured to kill him by

wounds in every accessible part of his body. The noise of his floundering upon the shingles was compared by our informant to that of all his bones being broken, which, added to his bellowing, was as terrible to the ear as the sight of so vast an animal exerting his utmost power for existence was to the eye." While yet on the Essex coast, he at one time became so much exhausted by beating about in shallow water as to suffer the master of a French vessel to lash him to the stern by a cable round his tail, thus promising to become an easy prize. No sooner, however, was he towed tail foremost into deep water than his strength became renovated: roused to exertion, he in turn pulled against the vessel, and proved the best swimmer, towing her stern forwards after him to a considerable distance. In the struggle, however, the cable broke, and, regaining his liberty, he stranded himself by Whitstable. His death was ultimately effected by a seaman acquainted with the whaling business, who thrust a spear in a proper direction and ended his sufferings. The quantity of oil procured was nine tons, besides the spermaceti, which was also considerable. Much, however, of both had been previously lost, owing to the nature of the wounds and the interval between the death of the animal and the *flencing*, as the process of cutting up the Whale is technically called.

The heart measured three feet across, the aorta or main artery arising from the left ventricle of the heart one foot three inches in diameter. The total length of the animal was sixty-three feet, and the circumference round the body thirty-six. The Cachalot, how-

ever, is said sometimes to reach the extraordinary length of a hundred feet. Its principal locality is the polar ocean of both hemispheres.

Our next genus is that of *Balæna*; it includes the Common Whale of the polar seas, an animal destroyed by man for the sake of its oil, which is so well known as an article of commerce. The chase of it employs thousands of men; every artifice which daring ingenuity can contrive is resorted to, and hence, huge and powerful as the monster is, it wages an unequal war. Year by year its numbers are diminished, and in latitudes where it formerly abounded it is now to be rarely met with.

In the Cachalots we found the lower jaw furnished with conical teeth; we now lose them altogether. Let us see how their place is supplied. The upper jaw, having the form of a boat reversed, is furnished along the two sides with long, subtriangular, transverse laminæ, of a horny substance, called *whalebone*, or *baleen*, set in close array; these plates of *baleen*, to the number of eight or nine hundred on each side, with the broad end fixed to the gum and the apex to the middle of the palate, have a fringed edge, loose and floating; they begin small, but increase to ten feet in length, and then diminish gradually. The lower jaw, unprovided with a similar apparatus, contains a thick fleshy tongue, and is arched outwards so as to embrace these fringed plates, and, when the mouth is shut, thus produce a kind of strainer or hanging grove of whalebone filaments touching the floor, so as to detain the moluscous animals on which the monster

feeds. These are of the smallest kind, for its organization, and indeed the diameter of the œsophagus, will not permit the Whale to swallow bodies of any magnitude. For hundreds of miles the polar seas are covered with *acalaphæ;* these the Whale engulfs by millions, straining them from the water by means of the hanging fringes of the upper jaw.

The COMMON WHALE *(Balæna mysticetus,* LINN.) equals the cachalot in magnitude. According to Captain Scoresby it is now seldom found more than seventy feet in length; it attained, however, in former days, when less disturbed by man, and suffered to live to maturity, dimensions far more considerable. Its blubber is many feet in thickness, and yields from seventy to a hundred barrels of oil. Of the whalebone or baleen we need say little; its use in the arts and in domestic economy is known to all.

The velocity with which the Whale dashes through the water is very great, especially when alarmed or irritated; and the lashings of its ponderous tail work up the sea into boiling foam: "He maketh the deep to be hoary." When roused from his slumbers on the surface of the water, where he lay "stretched like a promontory," by the pain of the harpoon, the first impulse of the Whale is to plunge deep beneath the waves, going at the rate of eight or ten miles an hour, and carrying the harpoon, to which a long line is attached, still fixed in the wound. The length of time the Whale remains under water is about half an hour, and it generally rises at a considerable distance from the spot where it went down, throwing up a

column of water as it approaches the surface. It is now, however, very exhausted, not only from the violence of its exertions, and the length of time it has been down, but also from the immense pressure of the water at the great depth to which it has descended. This depth is often as much as eight hundred fathoms, and, according to Captain Scoresby's calculation, the pressure sustained would be equal to two hundred and eleven thousand two hundred tons, a degree of pressure, he observes, "of which we have but an imperfect conception. It may assist our comprehension, however, to be informed that it exceeds in weight sixty of the largest ships of the British navy when manned, provisioned, and fitted for a six month's cruise."

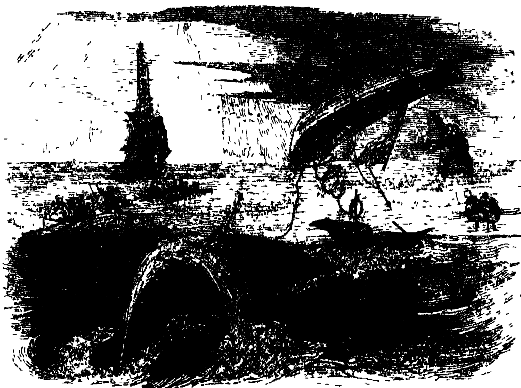
No sooner does the exhausted Whale appear, than (to use the words of Captain Scoresby) "the assisting boats make for the place with their utmost speed, and, as they reach it, each harpooner plunges his harpoon into its back, to the amount of three, four, or more, according to the size of the Whale and the nature of the situation. Most frequently, however, it descends for a few minutes after receiving the second harpoon, and obliges the other boats to await its return to the surface before any further attack can be made. It is afterwards actively plied with lances, which are thrust into its body, aiming at its vitals. At length, when exhausted by numerous wounds and the loss of blood which flows from the huge animal in copious streams, it indicates the approach of its dissolution by discharging from its blow-holes a mixture of blood along

with the air and mucus which it usually breathes out, and finally jets of blood alone. The sea to a great extent around is dyed with its blood, and the ice, boats, and men are sometimes drenched with the same. Its track is likewise marked by a broad pellicle of oil, which exudes from its wounds, and appears on the surface of the sea. Its final capture is sometimes preceded by a convulsive and energetic struggle, in which its tail, reared, whirled, and violently jerked in the air, resounds to the distance of miles. In dying, it turns on its back or on its side; which joyful circumstance is announced by the capturers with the striking of their flags, accompanied with three lively huzzas!"

The destruction of this monster of the deep is not, however, effected without danger, and frequent and often fatal accidents arise in the course of the expedition. Captain Scoresby, noticing these instances, observes, that "Captain Lyons, of the Raith of Leith, while prosecuting the whale fishery on the Labrador coast, in the season of 1802, discovered a large Whale at a short distance from the ship. Four boats were despatched in pursuit, and two of them succeeded in approaching it so closely together, that two harpoons were struck at the same moment. The fish descended a few fathoms in the direction of another of the boats, which was on the advance, rose accidentally beneath it, struck it with its head, and threw the boat, men, and apparatus about fifteen feet into the air. It was inverted by the stroke, and fell into the water with its keel upwards. All the people were picked up alive by the fourth boat, which was just at hand, excepting

one man, who, having got entangled in the boat, fell beneath it, and unfortunately got drowned."

Our annexed sketch, a copy of the original, repre-



sents this striking scene, and well depicts the hazardous nature of the undertaking.

The affection of the Whale for his mate, and of the parents for their young, is very great; and they have been known to perish rather than desert each other in the extremity of danger.

This instinctive attachment between the parent and its offspring is indeed a circumstance of which the fishermen often avail themselves in order to secure their prize. The cub, though of no value, is attacked to lure the mother to her fate, for she will not desert her young one in its distress, timid as she is by nature, and aware of the danger which menaces. The talented writer from whom we have just quoted, says, that in this trying moment, she joins her young one " at the

surface of the water, whenever it has occasion to rise for respiration; encourages it to swim off; assists its flight, by taking it under her fin; and seldom deserts it while life remains. She is then dangerous to approach, but affords frequent opportunities for attack. She loses all regard for her own safety, in anxiety for the preservation of her young; dashes through the midst of her enemies; despises the danger that threatens her, and even voluntarily remains with her offspring after various attacks on herself from the harpoons of the fishers. In June, 1811, one of my harpooners struck a sucker, with the hope of its leading to the capture of the mother. Presently she arose close by the 'fast-boat;' and, seizing the young one, dragged about a hundred fathoms of line out of the boat with remarkable force and velocity. Again she arose to the surface; darted furiously to and fro; frequently stopped short, or suddenly changed her direction, and gave every possible intimation of extreme agony. For a length of time she continued thus to act, though closely pursued by the boats; and, inspired with courage and resolution by her concern for her offspring, seemed regardless of the danger which surrounded her. At length one of the boats approached so near, that a harpoon was hove at her: it hit, but did not attach itself. A second harpoon was struck; this also failed to penetrate: but a third was more effectual, and held. Still she did not attempt to escape, but allowed other boats to approach; so that, in a few minutes, three more harpoons were fastened; and, in the course of an hour afterwards, she was killed."

Closely allied to the Whales of the genus Balæna, are several species separated into a genus termed *Balænoptera*, LACEP. These are distinguished by the presence of a dorsal fin, which the others do not possess, and by a greater slenderness of body in proportion to their length, which often reaches a hundred feet. Unlike the common Greenland Whale, *(Balæna mysticetus,)* the animals of this genus are frequently found to stray far from their native seas, passing our shores, and even visiting the Mediterranean. In an economical point of view these animals are of little value: their plates of baleen are small, the largest blade in a Whale of eighty-two feet not exceeding three feet, and their oil is of inferior quality. Hence they are avoided by the whalers, as not repaying them for the hazard of their capture, for their ferocity renders them extremely dangerous, and of all the Whale tribe there are none that equal them in the impetuosity and violence of their movements. If attacked, they return to the assault with fury, endeavouring to lash the boat to atoms, and thus endanger the safety even of good sized vessels. Their food is herrings and smaller fishes, which swarm in shoals, but whose numbers must be thinned by the ravages of these enormous monsters.

The genus Balænoptera is divided into *two sections;* the *first* distinguished by the smoothness of the skin of the throat and under parts, and containing only one species, the FINNFISCH of the Dutch, the Finfish of our writers, *(Balænoptera physalus;)* the *second* characterized by the deep longitudinal regular folds into which the skin of the throat and under parts is thrown. Of this section there are several species, two

of which are natives of the seas of northern Europe. Of these the ROROUAL, (*Balænoptera rorqual*, LACEP. or the *Balæna musculus* of LINN.) has been at different times seen on our own and the adjacent coasts of the continent. In 1178 one is recorded to have been thrown on the shore at Ostend. In 1402 eight whales were also stranded at or near the same place; and one also in 1762. In 1692 one was killed on the coast of Scotland; one was stranded at Eyemouth in 1752. In June, 1798, one was killed on the coast of Cornwall, where it ran ashore. Of later years several have been killed on the Irish coast, and also in the mouth of the Thames.

During the year 1832, the magnificent skeleton of an individual of this species was exhibited in London. It was thus obtained: "On the 4th of Nov. 1827, some fishermen of Ostend observed the dead body of this monster floating between the coasts of England and Belgium. Not being able to tow the enormous carcass themselves, the master of the shallop, Dolphin, of Ostend, who had likewise discerned it, employed the aid of his vessel and crew to move it, but without success. They then called to their assistance two other vessels, and by their united efforts surmounted the difficulty, and were enabled to appear in sight of Ostend at four o'clock next day; as soon as they entered the harbour the rope broke, and it was cast upon the eastern side." From its captors it was jointly purchased by M. H. Kepels, of Ostend, and M. Dubar, physician of that place, for 6283 francs, (about £.259.) By their spirited exertions its skeleton was prepared, and is one of the most imposing of objects connected with the history of animated nature,

calculated to lead the mind to Him who hath measured "the deep in the hollow of His hand," and created the leviathan "to play therein."

The following measurements of this Whale, a sketch of which is below, may give the reader some idea of its colossal magnitude.



Total length of the animal . . .	95 feet.
Height, or rather breadth of ditto .	18 ditto.
Length of head	22 ditto.
Height of skull	4½ ditto.
Number of vertebræ	62
Number of ribs	28, or 14 on each side.
Length of fins	12½ feet.
Length of rib	12 ditto.
Width of tail	22½ ditto.

Total weight of animal when found, 249 tons, or 480,000 lbs.
Total weight of skeleton, 35 tons, or 70,000 lbs.
Quantity of oil extracted from the blubber, 4000 gallons.
Weight of flesh buried in the sand, 85 tons, or 170,000 lbs.

Here we close our sketch of that great class of animals denominated *Mammalia*. We have traced the series of orders and the principal genera they contain from Man to the Whale; we have seen how parts are modified to suit the varied economy of various races; we have noticed the accordance of organs, so as to adapt one animal for a life of rapine, and another for browsing the verdant turf of the meadows; and the harmony of one part with another, proving design and

contrivance, carried out even into the utmost minutiæ of structure; we have endeavoured to point out how the balance of creation is preserved, how one race is influenced by another, and wherein their utility in creation lies. One duty yet is before us: it is to revert to Him who is the source of life and light, the great eternal God. "O Lord, how manifold are thy works! in wisdom hast thou made them all: the earth is full of thy riches. So is this great and wide sea, wherein are things creeping innumerable, both small and great beasts: there go the ships; there is that leviathan, whom thou hast made to play therein. These wait all upon thee, that thou mayest give them their meat in due season," Ps. civ.

Reader, this God of nature is the God of providence and of grace: "It is He that made us, and not we ourselves." He preserveth us day by day, and "waiteth to be gracious;" for "God so loved the world, that he gave his only begotten Son, that whosoever believeth in him should not perish, but have everlasting life." Let our contemplation of nature lead us then to a closer intimacy and communion with Him, who, in the beginning, was The Word, and who created the heaven and the earth, "when the morning stars sang together, and all the sons of God shouted for joy."



CHISWICK PRESS:—C. WHITTINGHAM, COLLEGE HOUSE.